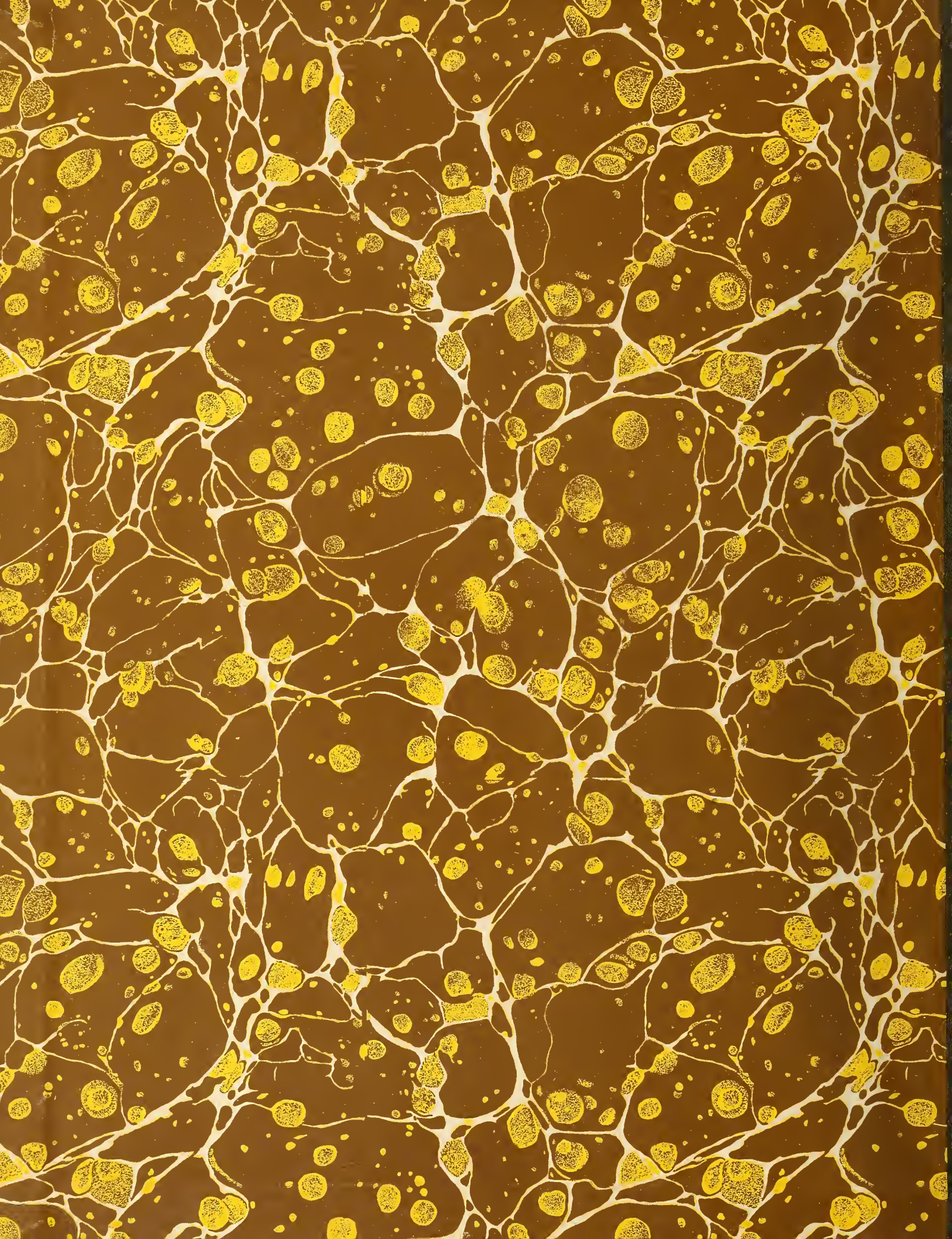
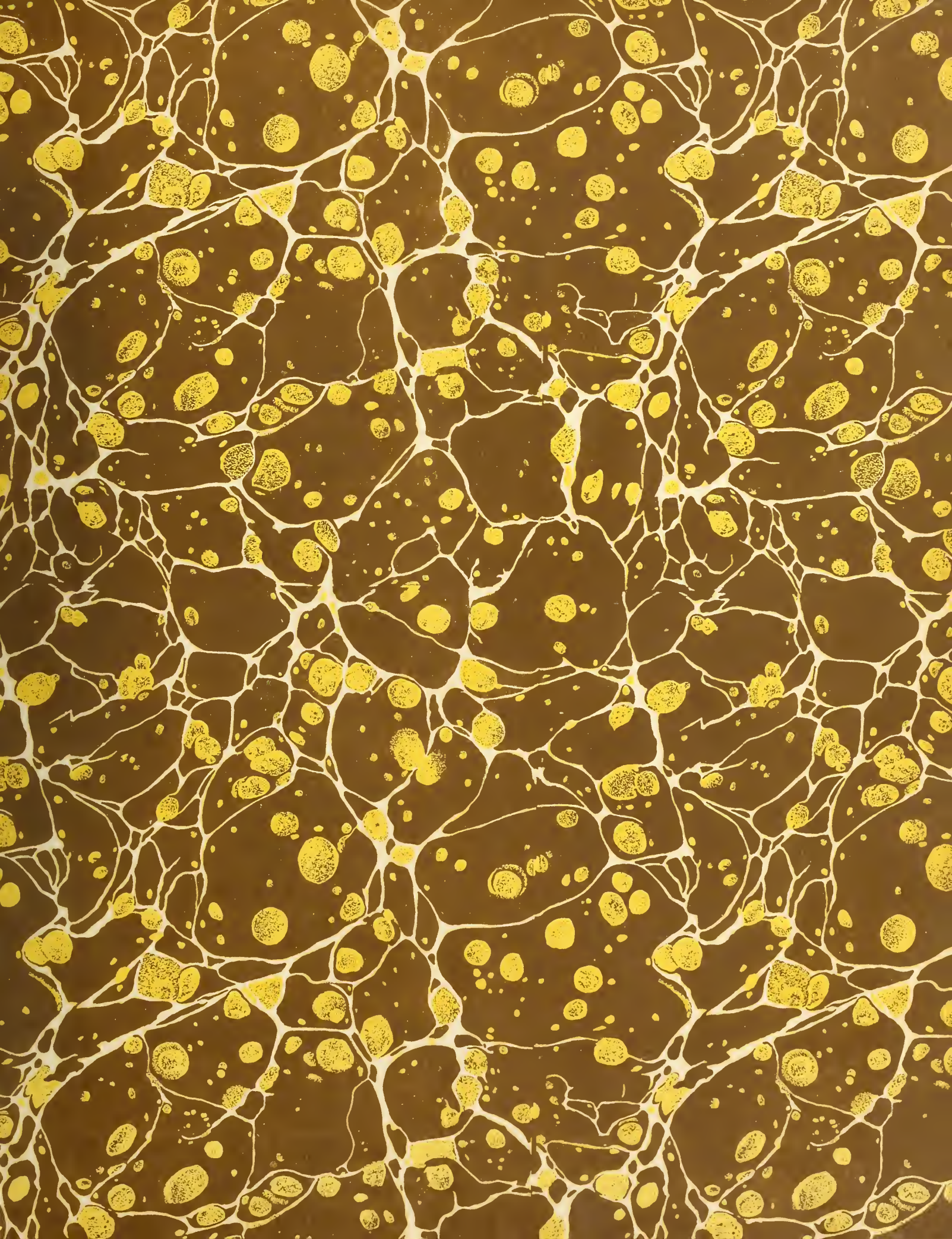


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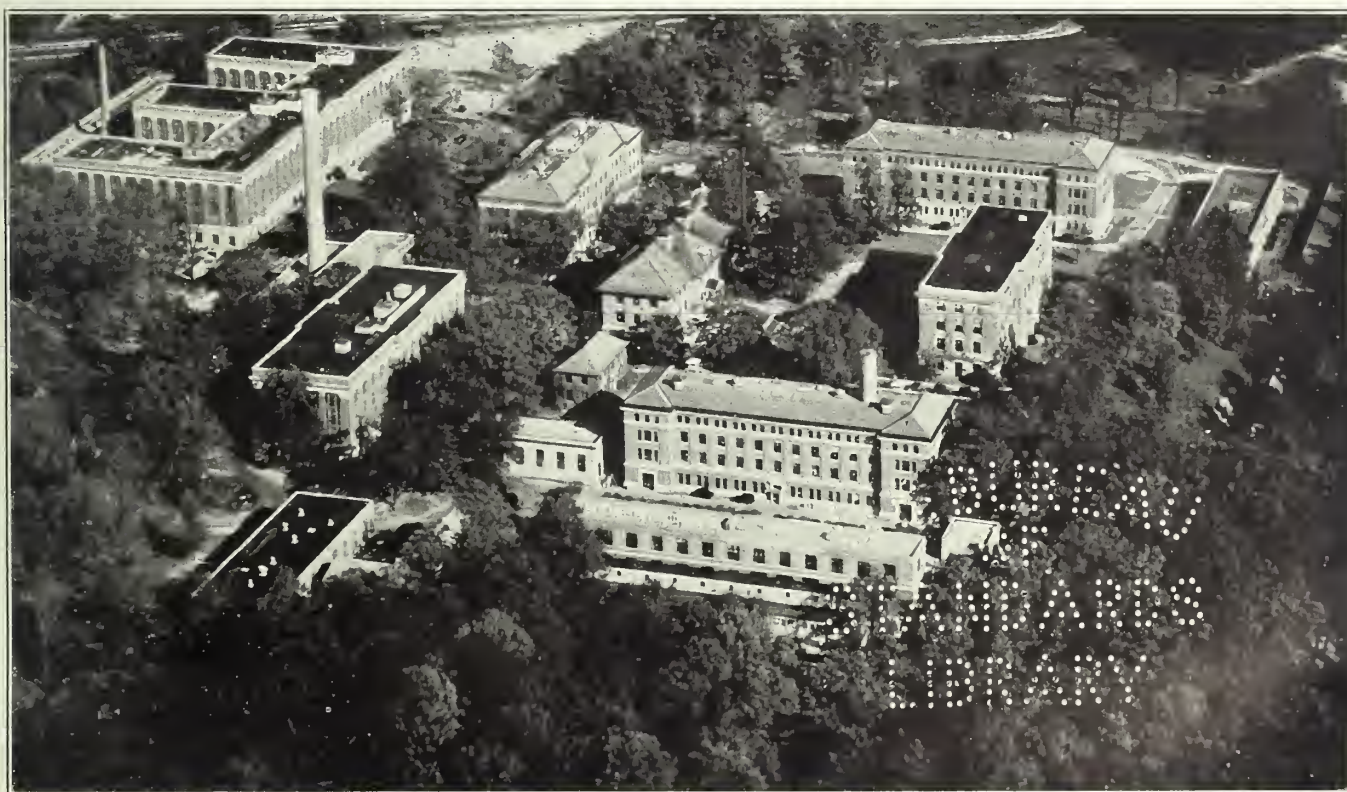
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COMMERCIAL STANDARDS MONTHLY



*A Review of Progress in
Commercial Standardization and Simplification*



ISSUED BY THE NATIONAL BUREAU OF STANDARDS OF THE
U. S. DEPARTMENT OF COMMERCE ~ ~ ~ ~ WASHINGTON, D. C., U. S. A.

Vol. 6, No. 1



JULY, 1929

UNITED STATES DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary

NATIONAL BUREAU OF STANDARDS

GEORGE K. BURGESS, Director

LYMAN J. BRIGGS

Assistant Director for
Research and Testing

COMMERCIAL STANDARDS MONTHLY

S. F. TILLMAN, Editor

RAY M. HUDSON

Assistant Director for
Commercial Standards

DIVISIONS OF THE COMMERCIAL STANDARDS GROUP

DIVISION OF SIMPLIFIED PRACTICE, EDWIN W. ELY.

The division of simplified practice was formed in November, 1920, to provide a clearing house or centralizing agency through which the manufacturer, distributor, and consumer groups could meet to discuss their common problems and decide upon eliminations which would prove of mutual benefit to all concerned. The activities of the division are purely cooperative in character. It orders nothing; it dictates nothing; the initiative must come from business itself. It has no regulatory nor police powers to enforce adherence to the simplified-practice recommendations that industry develops under the auspices of the United States Department of Commerce. Its chief function is to serve as a neutral meeting ground for the purpose of bringing together producers, distributors, and consumers, whose aims are sometimes divergent and possibly antagonistic, and who would be unwilling to cooperate, except through some unbiased central agency. Following the approval of the tentative simplified-practice recommendation by a general conference of all interested elements thereof, the project is then presented to the entire industry by letter referendum for its approval and written acceptance, the publication and indorsement of the recommendation on the part of the Department of Commerce being dependent upon acceptance of the program by at least 80 per cent, by volume, of the manufacturers, distributors, and users concerned.

AMERICAN MARINE STANDARDS COMMITTEE, A. V. BOUILLON.

The American Marine Standards Committee was organized to promote simplification of practice and elimination of waste in the marine and allied industries. It is composed of individuals, corporations, societies, Government departments, public bodies, or other organizations or groups engaged in building or operating ships, port facilities, and related activities. It works in close cooperation with official agencies, but its activities are controlled by an executive board elected annually by and from the membership. For further information, write direct to the secretary, A. V. Bouillon, Room 713, Department of Commerce, Washington, D. C.

DIVISION OF TRADE STANDARDS, J. F. FAIRCHILD.

The commercial standards unit, now known as division of trade standards, was created on October 1, 1927, for the purpose of aiding those industrial and commercial groups desiring to establish standards of grades, quality, or measurements for their products or their purchases on a purely voluntary basis.

The division functions only at the direct request of the industry concerned. Its procedure is similar to that of the division of simplified practice, except that at least 65 per cent of the industry, by volume of annual production, must accept the commercial standard in writing before it is published by the Department of Commerce. A certification plan is applied

DIVISION OF TRADE STANDARDS—Continued.

on request as a means of increasing the effectiveness of such standards. Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

DIVISION OF SPECIFICATIONS, A. S. McALLISTER.

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. The cooperation with technical societies and trade associations includes ascertaining the standardization and specification promoting activities of these organizations, and bringing to their attention the work being done by the commercial standards group. The cooperation with producers involves the compilation of lists of manufacturers who have expressed their willingness to certify to purchasers that materials supplied by them comply with the requirements and tests of certain United States Government master specifications or commercial standards. The division aids in preparing the Standards Yearbook; directories of governmental and nongovernmental testing laboratories; the Directory of Specifications; and is working on an encyclopedia series of specifications, of which "Standards and Specifications in the Wood-Using Industries" is the first volume which has been issued.

BUILDING AND HOUSING DIVISION, J. S. TAYLOR.

The division of building and housing cooperates with business, technical, and professional groups in practically all its undertakings on building and housing. Its work to modernize building codes and to encourage improved standards for the quality of building construction promotes the practical application of the latest development in design and use of building materials. This division was also formed in 1921.

In furthering home ownership, an effort is made to develop an enlarged, steadier, more intelligent, and more discriminating demand for soundly built dwellings, the largest single class of buildings which the construction industries provide. The division also cooperates with many business and professional groups in efforts to distribute building activity more evenly throughout the year, and to secure less fluctuation from year to year. The work on city planning and zoning has in mind the broad objective of buildings made more useful because well located with respect to other buildings, a well-coordinated street system, and appropriate public works. Good city planning and zoning likewise encourages stability in land values and property uses, and thereby contributes to the demand for durable structures.

Except where otherwise indicated, for further information address

BUREAU OF STANDARDS

WASHINGTON, D. C.

COMMERCIAL STANDARDS MONTHLY

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VOLUME 6

WASHINGTON, D. C., JULY 15, 1929

NUMBER 1

COMMERCIAL STANDARDS

Standards constitute the common language, even the common law, of modern industry and commerce. Certain standards, such as those used for weights and measures, are essential for public convenience, health, or safety, and have been fixed by legislative enactment. Mandatory standards of this character, however, are few in number when compared with the large and steadily growing volume of standards developed by industry and commerce and voluntarily maintained.

The activities of the commercial standardization group of the Bureau of Standards are concerned with standards adopted by voluntary agreement. These activities consist primarily in cooperating with industry in the development of standards and in promoting their adoption and use. Such standards may apply to dimensions, quality, performance, methods, business practices, terminology, or any other industrial or commercial matter in which uniformity is beneficial.

Recognized standards of this character developed by cooperative effort on the part of designers, manufacturers, distributors, and users constitute a powerful force for eliminating waste in production and distribution. Simplified practice, meaning elimination of unnecessary variety of products and concentration on a small number of standard products, offers many striking examples of the enormous benefits to be gained through voluntary cooperation. Many different groups must cooperate not only in developing standards but in establishing and maintaining them in general use.

Such voluntary cooperation is of equal value in providing means whereby standards may be modified to meet changed conditions or new development. The services of the commercial standardization group as a disinterested centralizing agency and clearing house are available to bring together the various groups concerned in developing and maintaining voluntary standards.

It is gratifying to find that the widespread interest in the commercial standardization work of the Department of Commerce has necessitated issuing the Commercial Standards Monthly as a printed publication. This work has grown in response to the demands of business men themselves. I trust that they will find this publication helpful, and that it will truly serve the American public.

R. P. LAMONT,
Secretary of Commerce.

NATIONAL BUREAU OF STANDARDS

"Can you give us an instrument that will measure the distance a ship is from shore, when the ship can not be seen?"

"We need a plate that can be used in taking photographs through fog."

"Some valuable Government documents have been burned; have you a way to decipher them from the crisps?"

"As an airship burns up its fuel it loses weight and to make up for this loss in weight, valuable helium gas has to be released at a cost of \$1,000 per flying hour. Please find some way to save this loss."

These are only a few of the questions that have been put up to the Bureau of Standards since its founding in 1901 and, let it be added, solved by the bureau's staff of scientific men. Operating as a great national research laboratory, the Bureau of Standards is constantly in touch with producers and consumers all over the United States. Its work is such that it is the natural focal point in this country for investigational work in the many lines that its organization covers.

The signers of the Declaration of Independence, who authorized this institution by giving Congress the right to "fix the standard of weights and measures," little realized that a hundred years or so later, men would be accurately measuring one one-millionth of an inch, or how much a 5-inch steel bar bends when your fingers are pressed against the ends. Beyond a doubt they would have shouted "witchcraft," if they had been told that clever gentlemen would one day be "fixing standards" for measuring such elusive things as electric currents, sound, heat, and light waves, air pressure, and radium, and that out of these researches would come discoveries such as

those hinted in the opening paragraphs of this little description.

There are two major groups in the bureau's organization. One deals with research and testing, and the other with simplification and commercial standardization. Each is under the supervision of an assistant director. The first group of the bureau includes fundamental research in practically every branch of physics and many branches of chemistry, metallurgy, and engineering. The second group cooperates with American industry in eliminating existing avoidable waste through the application of the principles of simplified practice and standardization.

The scientific and technologic work includes research on basic problems underlying precision measurement—the use of structural materials of all sorts, the development of improved methods, and the use of new materials and technique, as well as the performance of a large amount of testing for the Federal and State Governments. In a few words it might be said that the technical functions of the Bureau of Standards are: The development, construction, custody, and maintenance of reference and working standards, and their intercomparison, improvement, and application in science, engineering, industry, and commerce. Standards are divided into five

AN INVITATION TO VISIT THE BUREAU OF STANDARDS

An interesting fact in the growth of the bureau is the steady increase in the number of visitors. From all over the world experts come to see the work in progress in many specialties. Not alone the experts, but in growing numbers many of our people visit the bureau from a public-spirited desire to acquaint themselves with its research work. All visitors, from the newspaper men who have called the bureau a "house of wonders" to the specialists, are welcome, for it is their bureau in a very real sense. They are the owners of the business and its beneficiaries. The annual per capita cost of 2 cents which the average citizen pays toward the operation of the bureau yields returns sometimes a hundredfold or a thousandfold. How science turns wastes into profits, increases the useful life of materials, adds new efficiencies to industry, advances new arts, such as aviation and radio, by research and discovery—these are to be seen first hand in the scientific and technical laboratories of the bureau.

In inaugurating a new periodical I desire to extend anew to all citizens interested in scientific progress a cordial invitation to visit the laboratories of the Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m., daily, except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable, basic contributions to radio, aviation, and other modern arts and industries.

GEORGE K. BURGESS, Director.

classes, as follows: (1) Standards of measurements (measurements of lengths, mass, and time); (2) standard constants (mechanical equivalents of heat and electricity, constant of gravitation, etc.); (3) standards of quality (specifications for materials); (4) standards of performance (operative efficiency of machines and devices); (5) standards of practice (safety code for technical regulation of construction and operation of equip-

ment). The organization of the bureau is based not upon the classes of standards, but upon the kind of work.

Since the readers of *The Commercial Standards Monthly* are, in general, familiar with the work of "the commercial standardization group" of the bureau, this article will deal chiefly with the "research and testing group." This group consists of nine major divisions which are subdivided into sections. The section is the working unit which deals with some particular class of problems, such as time measurements, electrical measuring instruments, textiles, etc. There are 65 sections in the 9 divisions of the bureau. Each of these is devoted to a special line of work. On first thought, it might appear that each would be somewhat cut off from the others. This is not the case. Frequently a major research will require the cooperative efforts of many sections and even in the ordinary testing of materials, nearly always at least two sections, say in physics and chemistry, are involved.

The weights and measures division is the basic division of the research and testing group. It is a natural outgrowth of the work of the old office of weights and measures in the Treasury Department. This division has custody of the national standards of length and mass of the United States, upon which all our other standards depend.

In this connection the bureau has ruled precision scales for a manufacturer of high-grade tools direct from light waves with an accuracy so great that there was no measurable error in the finished scale. Precision gage blocks, the master length standards of our automobile manufacturers, etc., are likewise tested by optical methods with wonderful accuracy.

The reader may ask quite naturally how we assist in securing exact standards of measurement in commercial transactions, when the enforcement of weights and measures laws is entirely a State or municipal function. One way in which we assist is through conferences of weights and measures officials from all sections of the country. Each spring such a conference is held at the bureau, the twenty-second conference having been held on June 4 to 7, inclusive, of this year. Delegates from many of the States were present. All sorts of weights and measures problems were discussed.

Thus, without any regulatory power, the bureau is helping to secure uniformity in these matters in all parts of the United States.

The bureau owns four sets of equipment for testing railroad master scales and commercial track scales. The charges for all the revenue freight moved in this country, a matter of over \$4,000,000,000 per year depend on the readings of these scales. In 1914, when we started this work, only 38.2 per cent of the scales tested were within the limits of error set by the bureau as an acceptable standard of performance. During the fiscal year 1928, we tested 18 master

scales and 703 commercial track scales. Of the last named 70 per cent were within the tolerance. The importance of such an improvement is obvious.

The necessity for a laboratory fitted to deal with the basis standards in electricity was one of the strongest arguments for the establishment of the bureau. The field covered is very extensive, including the establishment and maintenance of the fundamental electrical units, such as the volt, ampere, and ohm; the testing of electrical measuring instruments, lamps, batteries, etc.; the investigation of important problems in the electrical field; and the preparation of safety codes covering the electrical and other industries.

One of the sections of this division deals wholly with radio communications. Many important improvements in this rapidly expanding field have been developed at the bureau.

The radio direction finder now largely used in navigation, the radiobeacon, the quartz oscillator, and many other developments were invented or perfected by Bureau of Standards employees. Just now a great deal of attention is being given to the elimination of interference in broadcast reception, the control of frequency of transmitting stations, and the development of radiobeacons for aerial navigation.

Lately much attention has been given to the problem of automobile headlighting. In cooperation with numerous States and cities, a considerable improvement has been brought about in this matter.

The work of the automotive power plants section of our heat and power division is of special interest to engineers. This section conducts investigations of the performance of all sorts of internal-combustion engines, including those used in aircraft and automobiles. Automobile engines are not only tested in this laboratory, but complete records of car performance on the road are secured by special apparatus. Through such work, the efficiency of automobile engines is being increased with a consequent increase in miles per barrel of crude oil.

In the altitude laboratory aircraft engines are tested under conditions encountered during an actual flight. The low air pressure and temperature existing at high altitudes can be duplicated in a chamber specially designed for this work. Aircraft engine testing was started when we first entered the war, and for some time the bureau's altitude chamber was the only one of this kind in the world.

The bureau is by law the testing laboratory of the aeronautics branch of the Department of Commerce. The type testing of commercial aircraft engines is now one of the major activities of the automotive section.

It may seem a far cry from engines to thermometers, but the establishment of standards for each involves heat and temperature measurements. The bureau tests many thousands of thermometers each year, as

well as pyrometers and other heat and temperature measuring instruments. One section of this division is concerned with the fire resistance of structural materials. Actual building materials, including full-sized walls and partitions, are tested in special furnaces. The intensity and duration of fires are studied in actual buildings and in special test houses. These are completely furnished with discarded material and are then set on fire. The temperatures attained are indicated by means of thermocouples and the time the fire burns is noted. Through this work better building construction is being brought about with a reduction of our tremendous fire loss, which formerly amounted to \$500,000,000 a year.

The work of the optics division includes such important subjects as spectroscopy, the investigation of sugar production and testing methods, the design and improvement of optical instruments, the use of light interference in precise measurement, and the protection of the eyes from injurious radiation, as well as studies of the ultra-violet transmission of glass and fabrics. The work leading to the establishment of the dextrose industry and the research now under way on levulose are important phases of the work of this division.

The spectroscope reveals to us the composition of the sun and stars, showing us that, vast as is the visible universe, it is made up almost entirely of elements with which we are familiar here on earth. In addition to telling us the constitution of a star hundreds of light years away, the spectroscope is the most accurate known means for analyzing metals, gases, and other materials, and will reveal traces of impurities which can not be found at all by chemical analysis.

By means of an extremely sensitive thermocouple, the surface temperatures of the planets have been measured. The results which have been secured may eventually lead to a determination of whether life exists on other members of the solar system.

The work of the chemistry division of the Bureau of Standards covers a great variety of subjects. Many of the investigations are carried out in cooperation with other divisions of the bureau. A great deal of the testing, in connection with the preparation of Government specifications, is performed by this division. Standards for paint, varnish, rubber, cement, reagents, etc., have been established.

The electrochemistry section has done some interesting and valuable work, including the development of a process for chromium plating. This is being used by automobile manufacturers, by makers of precision gages, and for coating the steel dies used by the mint, and the steel electroplates used for our currency printing. Even the casehardened steel plates wear out very rapidly, but covering the surface with chromium, the hardest metal known, its life is greatly increased. An-

other section deals with gas appliances, and has made a study of the proper utilization of gas in domestic appliances, the heating value of gas of different compositions, etc.

Assistance has been given to various municipalities in determining the responsibility for some cases of carbon monoxide poisoning.

The work of the mechanics and sound division includes the testing of mechanical appliances, such as elevator interlocks, fire extinguishers, and water current meters; investigation of the soundproofness of building materials; development and testing of aeronautic instruments for the Air Service; study of the aerodynamic properties of structures; and determination of the strength of fabricated metals, ropes, and cables.

Studies made in the sound laboratory have yielded valuable data on ways of rendering walls and floors more resistant to the passage of sound. Several publications have been issued giving practical information on the soundproofing of buildings and of airplane cabins. The performance of all sorts of devices and structures which must function in a wind stream are studied in three wind tunnels. One of the tunnels is 36 inches in diameter, and in it a wind speed of 180 miles per hour can be maintained. The second tunnel is octagonal in form with a cross section 54 inches between the sides. The third tunnel is 10 feet in diameter. The maximum wind speed possible in these last two tunnels is about 75 miles an hour. Many models of aircraft, aerial bombs, tall buildings, and chimneys have been studied by means of this equipment.

Current meters are used for measuring the flow of water in rivers and open channels. At the bureau, they are tested by towing them from a small electric car moving on a track over a tank 400 feet long. Thus the meter moves through the water instead of the water flowing past the meter, but both produce the same result.

The big testing machines of the engineering mechanics section are always of interest. The largest of these is a vertical machine with a capacity of 10,000,000 pounds in compression. This machine is being used to test one-fourth size models of portions of the columns for the new Hudson River bridge between New York and Fort Lee. The machine is operated hydraulically, oil under a pressure of about 3,000 pounds per square inch being supplied to a cylinder 52 inches in diameter located below the floor. Our largest horizontal emery machine does not have so great capacity as the vertical one, but is much more sensitive and accurate; in fact, it is really a precision instrument. This machine is capable of loading a specimen to 1,150,000 pounds in tension and to 2,300,000 pounds in compression. Variations of load of only 1 or 2 pounds can be detected.

The organic and fibrous materials division deals with rubber, textiles, paper, and leather. In establishing standards of quality and performance for materials of this kind, it is often necessary to study the actual manufacturing process. Frequently such work can not be carried out in a commercial plant. In some cases commercial machinery is used, while in others, as illustrated by the paper mill, the machines have been specially designed.

These plants enable the bureau to study carefully the actual processes by which materials are manufactured, and often it is able to suggest improvements which lead to better and cheaper products. New uses for materials are discovered and outlets found for waste products. Paper has been made from all sorts of materials, such as cotton linters, sugarcane refuse, banana stems, etc.

The durability of our paper currency has been more than doubled by the development in the bureau's experimental mill of an entirely new type of paper. Although the paper is unlike any ever before produced, it can be manufactured in existing plants and is no more expensive than the former material.

The bureau's work, just now getting well under way, on the utilization of waste products of the land is performed by this division. A satisfactory grade of wall board is being manufactured from corn stalks in a semicommercial plant erected by the bureau and the Iowa State College at Ames, Iowa. Peanut shells have been used with some success as a substitute for hardwood shavings in the manufacture of gypsum fiber concrete.

The metallurgical division is equipped to go through all the processes employed in the casting, working, and heat treatment of metals. There is an experimental foundry, equipped with gas, oil, and electric furnaces, rolling mill, forging press, draw bench, heat-treatment plant, etc. These machines are of medium size and capable of doing some real work. Very complete equipment is provided for the microscopic study of the structure of metals. Recently the X ray has been taken up as a means for getting at the inside history of metals and alloys.

In no industry are high standards more dependent on exact scientific work than in metallurgy, yet for years most of the processes were controlled by "rule-of-thumb" methods.

For many years a great deal of attention has been paid to rail failures and ways for preventing them. The bureau is cooperating with the steel makers and the railroad companies on the problem of "transverse fissures." This study requires hundreds of tests on new rails and on rails which have been subjected to varying lengths of service.

The prevention of corrosion of duralumin, the light alloy used in aircraft construction, has been studied.

It has been found that by proper heat treatment and by coating the duralumin with a layer of pure aluminum, corrosion can be largely eliminated.

Passing now to the last of the technical divisions, we may consider as typical of the work of the ceramics division its activities with respect to optical glass. Before the war not one pound of optical glass was made in this country. Our lens makers led the world, but they all worked with German or French glass. When the war came the foreign supply of glass was cut off, and our Army and Navy were threatened with a shortage of all the optical instruments which are absolutely essential to modern warfare.

Dr. S. W. Stratton, who was then director of the bureau, realized the danger of the situation, and processes for making optical glass were developed at the bureau in cooperation with the Geophysical Laboratory and with manufacturers. The whole difficult technique had to be developed, but in 1917 we were able to produce the highest grades of optical glass, and we have been making it ever since. Most of our glass now goes to the Navy Department and is used in gun sights, periscopes, range finders, officers binoculars, etc.

This section has completed the casting of the largest piece of optical glass ever made in this country and one of the three or four largest in the world.

This is a disk of glass 70½ inches in diameter and 10½ inches thick, weighing about 3,500 pounds. It will be used as the mirror for the reflecting telescope at Ohio Wesleyan University. It required 8½ months for cooling and annealing and over 70 hours for drilling an 8-inch hole through the center of the disk.

This division also deals with chinaware, heavy products, refractories, cement and concrete, lime, gypsum, and enameled ware. New uses have been found for American clays. Waste in these industries through defective ware has been greatly reduced.

The bureau tests samples of all the cement which the Government buys. To expedite this work, three branch laboratories are maintained. They are at Northampton, Pa., Denver, Colo., and San Francisco, Calif. The advisability of somewhat extending the work of these laboratories, particularly at San Francisco, to assist Government agencies and the States in the vicinity is now being considered.

This covers briefly the various scientific and technical divisions of the bureau.

Now a word or two about the man that directs the destiny of the Bureau of Standards, Dr. George K. Burgess. Science is a romantic adventure to him, for he is a man in whom the sense of adventure is inborn. From his ancestors, staunch New England seafolk, who helped make history in the days of the clipper ships, he inherited a thirst for the mysteries that lie beyond shadowy horizons.

Born in Newton, Mass., physics became Doctor Burgess's greatest interest. He matriculated at the famous Massachusetts Institute of Technology in 1892, and in 1896 received his degree of bachelor of science. Years of study abroad followed, and in 1901 he won his doctor's degree at the Sorbonne, in Paris, being one of the first Americans to achieve this scholarly distinction.

He was in California when he learned that the Bureau of Standards, then under the Treasury Department, was to be transferred to the Department of Commerce and Labor and enlarged. As he tells it to the editor, he "hotfooted it back to Washington" and took the necessary examinations, and in 1903 was appointed an associate physicist, the twenty-third person to be employed. In 1913 he was placed in charge of the division of metallurgy, and after 10 years was named director of the bureau.

In closing this article, attention is invited to the fact that, in accordance with the organic act of the Bureau of Standards, its services are available without charge to the National and State Governments. It is in following out this provision that the bureau acts as the principal testing laboratory of the Government.

The bureau's director is ex officio chairman of the Federal Specifications Board, which has done much to unify Government purchasing requirements. Much of the testing for the board is performed by the bureau.

In the case of tests for private industry, nominal fees are charged, but these fees are not available for the support of the bureau's work. They are turned in to the United States Treasury. The bureau is therefore dependent upon the appropriations made by Congress and a comparatively small sum transferred by other departments for the maintenance of its activities.

The work of the Bureau of Standards is made available to the public through its three monthly periodicals—the Bureau of Standards Journal of Research, the Technical News Bulletin, and the Commercial Standards Monthly—by articles in the scientific and technical press, and the daily newspapers.

Every effort is made to keep in mind that the Bureau of Standards is a public service organization. It is therefore our policy to give as wide publicity as possible to any worth-while results growing out of our work. Many improved devices and processes now in extensive use have originated in the bureau's laboratories.

COMMERCIAL STANDARDIZATION GROUP—A SERVICE ORGANIZATION FOR THE ELIMINATION OF WASTE

By RAY M. HUDSON, *Assistant Director for Commercial Standards*

Secretary Robert P. Lamont, in taking office as Secretary of Commerce, said: "The keynote of the department has been that of service to American business. It shall be my purpose to encourage the development of this phase of our activity."

Out of the nation-wide interest of business men in the Hoover Committee's survey of "waste in industry" has come a steadily increasing effort toward the elimination of waste. As manufacturers, distributors, and consumers have studied existing wastes of time, material, and human energy in our productive and distributive processes, their sense of responsibility for waste, its causes and its correction, has quickened into definite effort for its elimination. Not only have these primary interests asked and received cooperation from one another but they have also called on the Department of Commerce for its cooperation.

The purpose of the Department of Commerce is "to promote the trade industry and commerce of the United States." The purpose of the department's Bureau of Standards is the development, custody, and maintenance of basic standards, and cooperation in the advancement of American industry through research, testing, and commercial standardization. Under the latter heading comes simplified practice, defined as

the reduction of unnecessary variety in sizes, dimensions, etc., of commonly used commodities.

In the eight years since the Hoover Committee recommended simplified practice as an effective means of reducing waste the bureau's division of simplified practice has assisted industry in simplifying 110 different and widely diversified commodity lines. The fields covered include building materials, hardware and mill supplies, plumbing supplies; hospital, home, hotel equipment; containers; and many other classes of goods. This cooperative effort has helped to reduce inventories and idle investment, to speed up turnover, increase sales volume, cut manufacturing and selling costs, increase profits, values, and improve quality and service. The success of the simplification movement stimulated interest in standardization of grade and quality of products; the development of specifications and wider use of specifications in buying.

Continued calls for cooperation along these lines have required the Bureau of Standards to augment its service to industry, and its division of trade standards is working with nearly 50 different commodity groups in perfecting standards of grade and quality for their goods. To date, commercial or trade standards have developed for 14 commodities, including

clinical thermometers; dry-cleaning fluid; staple porcelain plumbing fixtures; steel, brass, and wrought-iron pipe nipples; surgical gauze; domestic and industrial fuel oils, etc.

Arrangements are being made with the American Standards Association for certain of these trade standards to come before it for consideration and possible approval as American standards under the well-known and effective procedure of that body.

The bureau's division of specifications is cooperating with the Federal Specifications Board and the Federal Purchase Board, as well as State, county, and municipal purchasing agents, in the wider use of Federal specifications. Governmental buyers are finding in this service many advantages and benefits, such as increased availability of goods made to Federal specifications, greater uniformity in quality, better value, and better service.

Over 2,000 manufacturers have signified to the bureau their willingness, when so requested by the purchaser, to certify that their goods conform to these nationally recognized standards and specifications. Many of these producers are not waiting for the buyer to ask the question, but are advertising the fact that their goods meet these standards, and are labeling them accordingly.

The greater protection thus afforded the consumer is steadily building good will for the manufacturers and strengthening their businesses.

The enlarged export business of the United States and the rapidly growing use abroad of simplification and standardization has brought a demand for further cooperation in the translation of American standards and specifications into foreign languages for the convenience of foreign buyers. Service of supply, including transportation facilities and means of communication, has advanced to the point where buyers no longer shop exclusively in the nearest market. More and more of them are looking over all the sources of supply and selecting those goods which to them represent the best all-around value. The keener competition has resulted in greater effort by producers of one country to familiarize buyers in another with their products. Standards are always bases of comparison, and their translation into many languages is essential to that purpose. The Bureau of Standards and the Bureau of Foreign and Domestic Commerce are cooperating in this service, with increasing benefit to American exporters.

At home the great postwar expansion of the construction industry—now doing an annual business of more than \$7,000,000,000—has increased the call for simplification and standardization of building materials, methods, practices, codes, and laws.

The bureau's division of building and housing is cooperating with many organizations and agencies, governmental and private, in preparing and promoting

standard building codes, plumbing codes, minimum requirements for construction for small dwellings, city planning and zoning measures, and related matters. The promotion of home ownership, increased protection for the home owner, and improved community conditions and facilities are all tangible results of this cooperative service.

Collectively, the commercial standardization group is a service organization, set up at the request of industry and allied interests, to assist in attaining certain specific objectives. These objectives, definitely recognized as in the public interest, include higher efficiency and greater stability for business, improved service to the ultimate consumer, increased values in his purchases, and greater individual prosperity.

In their attainment the elimination of waste, whether of time, material, or human energy, is basic and fundamental. It affords a common cause in which all interests or elements find large opportunities for growth and for the creation of greater wealth, not alone for the few but for the many—in fact, for the Nation.

The commercial standardization group of the Bureau of Standards is essentially and primarily a service organization for American industry, trade, and the consuming public. Its services are open to any and all of these elements of our national life. All that is necessary to obtain the cooperation of this group is a definite request from those responsible bodies whose objectives are consonant with those for which this service organization has been established.

"A white elephant sale" staged by a department store in the southwest part of the country, to get rid of an accumulation of shelf warmers, has been reported as having met with gratifying success. A 4-page advertisement in the local newspaper of the town was headed "White Elephants Among Our Souvenirs." The body of the advertisement treated the quality and condition of the merchandise humorously, but with perfect candor. Goods that were old and shopworn were so described, and if the merchandise was no longer in style mention was made of the fact. The following are examples of copy and headlines: "Winter Coats—Vintage of 1927; Men's Suits—Hardly as Stylish as They Used to Be; and Warm Woolen Blankets—But Ugly." The merchandise featured in the sale was out of date or of such a type that it had been considered a total loss, but it is reported that most of the goods were sold before noon on the day of the sale. The application of simplified practice tends to eliminate such "white elephant sales" as this, since the simplified program embraces only those varieties that are in constant and consistent demand by the consumers.

BUREAU PUBLICATIONS

The Bureau of Standards publishes three magazines monthly and a yearbook, in addition to miscellaneous pamphlets. The three monthlies are: The Bureau of Standards Journal of Research, the Technical News Bulletin, and the Commercial Standards Monthly.

The Journal of Research is a monthly periodical of pure and applied science. It made its début just one year ago, July, 1928, as a consolidation of Scientific Papers and Technical Papers. The union of pure and applied science in one journal has a tendency to bridge the gap between the two fields, thus shortening the interval between discovery and its application.

Prompt and complete information on the latest developments in scientific research are of value not only to the technician but also to the business men of the country.

Researches of the Bureau of Standards have specifically to do with fundamental science and the laws of matter and energy; physical constants and other basic data in the form of tables, equations, or graphs; the properties of materials, structures, and devices and their effective design and performance; the mitigation of injurious effects of such agencies as fire, corrosion, breakage; the promotion of efficiency by scientific, measured control of processes through experimental and theoretical research in the fields of physics, chemistry, engineering, and the special technologies.

Several hundred researches are in progress at the Bureau of Standards, and the outlet for the results is the Bureau of Standards Journal of Research. The subscription price is \$2.75 annually and \$3.50 for foreign mailing.

The month-by-month record of progress of an investigation is often as interesting as the final report. Even the obstacles and setbacks which are always encountered are worth knowing about. Their solution often calls for great ingenuity in methods and apparatus.

The best way to keep informed of what is going on in the laboratories of the Bureau of Standards is to read the Technical News Bulletin. This is based on the monthly reports of the various divisions to the director. You are made a partner in the bureau's work. Through this bulletin you can learn about new work initiated, progress in current researches, and important conferences in which the bureau has been or will be represented. One of the most valuable features is the complete list of publications by members of the staff, not only papers published in the regular series of the bureau but in outside journals as well.

With the December number is supplied, for reference purposes, a complete cross index for the year.

The Technical News Bulletin will soon complete its twelfth year. Originally published for the benefit of the Army and Navy during the war, it is now sent to a varied mailing list of scientists, engineers, manufacturers, branches of the National and State Governments, technical journals, and many of the leading newspapers. The subscription price is only 25 cents per year.

With this issue the Commercial Standards Monthly makes its début as a "regular" printed magazine. Since its inception, April 12, 1925, it has been a multi-graphed bulletin, distributed without cost to those interested in the subject of elimination of waste through simplification and standardization.

In its new form Commercial Standards Monthly will expand the scope of its news and give its readers a more comprehensive account of progress made in standardization and simplification and, it is hoped, a clearer vision of just what the functions of the Bureau of Standards mean to the American public. The subscription price is \$1 a year, and \$1.25 for foreign subscriptions.

In connection with the firemen's short course to be given at the University of Illinois, a paper will be given by C. R. Brown, assistant physicist of the Bureau of Standards, United States Department of Commerce, on Safeguarding the Storage of Photographic, X Ray, and Motion-Picture Films.

The recent disaster in Cleveland has emphasized the importance of proper storage of such films, large accumulations of which are often present in hospital buildings.

Most of the film used for the purpose up to the present has been of the nitrocellulose type that ignites at relatively low temperature, burns very rapidly, and gives off poisonous and flammable gases.

The storage of such film should be made in vaults constructed to resist moderate pressure from the rapid combustion of the film and mild explosions sometimes incident therewith. Suitable vents should be provided to the outside of the building for the gases given off. Self-closing doors, preferably opening inward into the vault, should be provided, with sufficient strength to resist the pressure.

The arrangement within the vault should be such as to minimize the possibility of ignition of the film and at the same time afford easy extinguishment of fire by means of the automatic sprinkler protection required for such storage.

FEDERAL COORDINATING SERVICE

By H. H. ROUSSEAU, *Rear Admiral (CEC), United States Navy, Chief Coordinator*

The trend is toward making standardization an active principle in organization and administration in every field. * * * Standardization is becoming an aspect of all well-ordered activity rather than an incidental activity supplemental to others.—STANDARDS YEARBOOK, 1927.

In the Government field this trend is exemplified by the organization and development of the Federal coordinating service.

The establishment by Executive order of the Office of Chief Coordinator, which followed soon after the passage of the Budget and Accounting Act in 1921, placed at the disposal of the Chief Executive for the first time in our history an agency empowered to coordinate the business affairs of the executive branch of the Federal Government.

The decision of the President to avail himself, under the authority reposed in him by the Constitution, of the assistance of such an agency was of far-reaching importance, and the beneficial results of this step are becoming increasingly evident in all Government business transactions.

The Chief Coordinator is an instrumentality for relieving the President of the details of directing Government administration in all its branches along the lines of unified business policy and standard procedure.

The coordinating service comprises the central organization in Washington, consisting of the Office of the Chief Coordinator and 12 coordinating boards, and the field service, consisting of 9 area coordinators and about 280 active Federal business associations, the latter distributed throughout continental United States, including Alaska, Hawaii, and Porto Rico.

The Office of the Chief Coordinator comprises the Chief Coordinator, an Assistant Chief Coordinator, and seven assistants to the Chief Coordinator, all assigned for this duty from the various departments and establishments of the Federal Government. The office maintains close touch with the coordinating boards themselves, and with the field service by means of reports, correspondence, and occasional personal visits.

The coordinating boards have cognizance of the subjects of printing (in collaboration with the Joint Committee on Printing), real estate, purchasing, liquidation, motor transport (for the District of Columbia), traffic, specifications, hospitalization, contracts and adjustments, office procedure, patents (with respect to inventions and patents evolved by Government employees or acquired by the Government), forest protection, and the compilation of a Federal standard stock catalogue.

The nine area coordinators, who are in charge of field coordination, and who are the connecting links between the Chief Coordinator and the Federal business associations, are assigned to territorial districts based primarily on the corps areas of the War Department.

The Federal business associations are organized to provide contact between the Chief Coordinator and Federal agencies in the field. The associations also provide a means for closer contact with each other of Federal officials in a given locality, not only in order that the principles and policies of coordination might be better inculcated in the minds of these officials, but that by bringing these representatives together from time to time they might know each other personally and, by taking common counsel, exchange ideas and experiences and develop standard methods of business procedure that would be in accord with the spirit of interdepartmental coordination and result in corresponding benefits intradepartmentally as well.

Some of the projects which have occupied the attention of the coordinating service and have resulted in increased efficiency in the conduct of the Government's business are as follows:

(a) A new and flexible system of collecting and distributing weather reports to insure the safety of pilots and passengers in aviation operations.

(b) Plans for the prevention and suppression of forest fires and the defense of forest areas against the depredations of insects.

(c) The liquidation of Government surplus property since the armistice of over \$4,000,000,000 in original value.

(d) The consolidation on a national scale of the requirements of the Government departments and establishments for the purchase of many articles of supplies formerly bought in scattered lots at high prices.

(e) The distribution to the various Federal activities of confiscated alcohol and liquors for use in antifreeze solutions and for medicinal purposes.

(f) The adoption of over 600 Government master specifications to standardize the Government's requirements for supplies and materials.

(g) The adoption of 43 Government standard contract forms to replace hundreds of forms in prior use and to simplify the procedure for commercial firms in doing business with the Government.

(h) The mobilization of trucks from all Federal activities to assist the Post Office Department to speedily distribute the Christmas mail and avoid the congestion formerly obtaining in this respect.

(i) The adoption of standardized Government travel regulations for Federal personnel.

(j) The economical routing of Government freight and the adjustment of faulty freight classifications.

(k) The establishment of Federal communication service to handle dispatches for departments and establishments over Government radio, cable, and leased wire networks.

Many other than the above examples of accomplished coordination could be given if space permitted, as well as additional projects about to be undertaken.

Perhaps by far the greater benefits from coordination are intangible and can not be evaluated in dollar and cents. However, certain of the economies effected can be recorded, and the following figures of savings, taken from the seventh annual report of the Director of the Bureau of the Budget, are the latest available. These figures are exclusive of intradepartmental economies reported directly to the Director of the Budget by heads of departments and establishments and exclusive also of savings effected through interdepartmental transfers of surplus property from

the armistice to April 30, 1928, which aggregate \$143,619,929.

Aggregate of savings effected to April 30, 1928, through activities of the interdepartmental coordinating service since its inauguration

Area coordinators.....	\$4, 893, 447. 70
Federal communication service.....	5, 439, 304. 61
Coordination of telephone service, District of Columbia.....	85, 241. 17
Loans of transportation to Post Office Department for handling Christmas mails.....	574, 365. 92
Coordination of traffic, Federal Traffic Board..	1, 272, 988. 76
Coordinator of motor transport, District of Columbia.....	95, 264. 12
Aggregate.....	12, 360, 612. 28

When consideration is given to the newness of the field in which the coordinating service is operating and the small force of personnel assigned to this duty, it is believed that the showing made is indeed remarkable.

FEDERAL SPECIFICATIONS BOARD

By direction of the President, the Federal Specifications Board was organized under authority of Circular No. 42, Bureau of the Budget, dated October 10, 1921, for the purpose of coordination and economy in the procurement of materials and service used by the Government under specifications prepared by the various branches thereof; to avoid duplication of effort and for the better utilization of industries. The duties of the Federal Specifications Board are to compile and adopt standard specifications for materials and services and to bring the Government specifications into harmony with the best commercial practice wherever conditions permit, bearing in mind the desirability of broadening the field of supply.

Each department and establishment purchasing materials and supplies in accordance with specifications designated a representative to serve as a member of the board.

The procedure adopted for the consideration of the specifications is as follows: The need of specifications for a given article or material, for either technical or business reasons, is fully considered by the executive committee of the board, and the subject is then referred to a technical committee composed of the Government experts in the particular subject, for consideration of all existing Government or commercial specifications. A specification is selected, or written, which will be suitable for the uses of all departments and establishments of the Government. The cooperation and advice of interested commercial and industrial concerns is requested and their recommendations are

fully considered by the technical committees. The specification as agreed on by the technical committee is then submitted to all departments and establishments of the Government, through their respective representatives on the Federal Specifications Board, for comment and criticism. At the same time copies of the proposed specifications are submitted to the American Engineering Standards Committee with a request for its assistance in securing comment and criticism from the various interested engineering and technical societies all over the country. All criticisms received are referred to the respective technical committees for consideration on their merits. When the specification is finally agreed upon it is promulgated by the Federal Specifications Board as official Government Standard for use in connection with the purchase of material covered by the specification.

The specifications adopted and promulgated by the board shall be binding upon and govern all departments and independent establishments of the Federal Government in so far as applicable.

The board now has 75 technical committees, composed of representatives from all branches of the Federal Government, and has promulgated 621 Government master specifications. The chairman ex officio is Dr. George K. Burgess, Director of the Bureau of Standards, and the technical secretary is Maj. R. W. Voeth.

Standardization of specifications is the first and most essential step in the economy that arises from the purchase of materials in large quantities. It is a

necessary factor in the improvement of the quality of materials purchased and the adaptation of quality to definite uses. The purchase of materials in accordance with well-defined standards, understood and agreed upon by the purchaser and producer alike in the contact, is the only way by which materials can successfully be purchased by competitive bids. With such standards the Government is enabled to take advantage of this method in securing the lowest price that can be obtained for an article of the required standard. Without them the reputable bidder is not only at the mercy of the unscrupulous one, but the Government is deprived of the legitimate economy resulting from this method of purchasing.

The great value of specification standardization from the standpoint of the Government lies in consolidated purchases to a single standard specification for a given article. This results in economy. From a military standpoint, supplies can more readily be

purchased in an emergency owing to standard reserve stocks and a greatly enlarged market.

The selection of a specification or standard without due regard to the manufacturing problems involved would be equally as serious as for manufacturers to establish them without a careful consideration of the needs of the purchaser. In the selection of specifications for Government use the Federal Specifications Board is coordinating these two interests in a manner which is fair to and understood by both the manufacturer and the user, and will in time base all Government purchases on correct standards of quality and practice.

Specifications adopted and promulgated as United States Government master specifications by the board are listed in Bureau of Standards Circular No. 371, which is furnished gratis upon request to the Federal Specifications Board, care Bureau of Standards, Washington, D. C.

AMERICAN STANDARDS ASSOCIATION

Russell Forbes, nationally known as an expert in purchase practice and municipal administration and as a teacher of government, has prepared a comprehensive book, entitled "Government Purchasing," according to the ASA Bulletin of the American Standards Association, as a dissertation for the doctorate in political science at Columbia University.

His treatment of the purchasing problem, says the ASA Bulletin, will be of direct interest not only to Federal, State, county, and municipal buyers, but also to everyone concerned with the allotment and expenditure of tax moneys, and to purchasing agents of large private concerns. He recognizes with unusual clarity the importance of standards as a factor in the purchase problem and cites important instances of savings gained through the standardization technique; for example, in the State of Massachusetts where the average price of envelopes was reduced from \$2.85 to \$1.68 per thousand through standardization of sizes and grades. Similarly in this State, where 300 styles of letterheads were in use by the State government, standardization upon 50 styles dropped the cost of the printing of 3,000,000 sheets of paper from \$1.75 to 50 cents per thousand.

J. B. Osler, writing in *Modern Transport*, London, England, suggests the adoption of a standard chassis for large fleet of trucks, says the same issue of the ASA Bulletin:

"It is desirable, as far as possible," said the writer in his article, "that all bodies of the same carrying capacity should be constructed on chassis of exactly the same design and type. The man in the workshop

becomes an expert on certain jobs on account of its having to be done always in exactly the same way. Vehicles of the same pattern, therefore, can be passed through the workshops more quickly than would be possible if they were of mixed design. In cases where a fleet numbers 50 or more vehicles of exactly the same type, it will be found an economy to construct special jigs and tools to handle the work. No difficulty is experienced in changing drivers from one vehicle to another on similar type vehicles. In cases of breakdown on the road there is no difficulty in picking out the correct part which is required to put the vehicle right, and should it be the case that this particular part is not actually in stock when required it would be possible to take one off a spare vehicle and send it out to the vehicle which is broken down, and thus enable it to proceed on its journey."

In bringing out a comprehensive report on the results of its study of the standardization movement, the National Industrial Conference Board has rendered a notable service to industry, observes the editor of the ASA Bulletin, with the remark that "the report is written from the point of view of an industrial executive, considering the movement as a whole and in his company's relation to the movement; the methods and experience of selected companies making extensive use throughout of standardization as a major tool; the relation of his company to the standardization activities of technical societies, of trade associations, of the American Standards Association, and of the Federal Government; its economic advantages and

limitations; its influence as a business stabilizer; and especially the more recent trends toward the use of standardization as a technique in the marketing problem, the managerial question now receiving the most emphasis through executive attention."

The standardization activities of trade associations and technical societies are summarized with illustrated material from typical organizations. Separate chap-

ters are devoted to the work of the Bureau of Standards, the Department of Agriculture, the American Standards Association, and to international cooperation.

In closing its review of this report, the ASA Bulletin recommended that the "report should be read by every industrial executive or engineer interested in any phase of standardization."

NEWS ON FOREIGN STANDARDIZATION

The question of standardization occupies an important place in the economic program of the Soviet Union, says the Soviet Union Review (2819 Connecticut Avenue, Washington, D. C.), noting that "about 500 standards, connected with the most diverse branches of industry, have been officially adopted. A thousand more are being developed and tested. The achievements of the U. S. S. R. in this field received recognition at the last International Standardization Conference in Prague, where it was decided to elect the U. S. S. R. as one of the nations to direct the work of standardization on an international scale, 'in view of outstanding services in the field of standardization.'"

Leading British truck manufacturers in their fight against American competition have reached a basis of agreement for a merger of the whole industry and a reduction of 25 types of truck to 5, accompanied by mass production, according to a recent dispatch carried in the Wall Street Journal. Quoting the London Evening Standard, the Wall Street Journal statement said that "the plan may be extended to the whole automobile industry in the near future. Sir Gilbert Garnsey, who arranged the recent wireless-cable merger and reorganization of Lipton chain stores, is the leader in the new enterprise."

In presenting its third yearbook the Canadian Engineering Standards Association takes the occasion to announce that it is "pleased to again report a continued growth in the work of standardization in Canada" and that "the relations between the association and Canadian industrial interests are most cordial, and there is every evidence that the work done by the association has been of practical service in many industrial problems."

Only one specification was issued by the association during 1928, it being the third edition of the Specification for Steel Railway Bridges, which has been officially adopted by the Board of Railway Commissioners for Canada.

"The progress made by the Canadian Electrical Code," says the announcement of the association, "has been outstanding, and there is every indication

that it will be officially adopted throughout Canada in the near future."

The Canadian Engineering Standards Association was organized during the latter part of the World War, at the suggestion of the British Board of Trade and the British Engineering Standards Association. The main object of the association is to promote the establishment of industrial standards by providing an organization to receive requests for standardization, investigate their desirability, and arrange for the formation of committees, comprising representatives of both manufacturers and users, to determine standards that will be acceptable to all interests concerned.

The association itself is not concerned, nor does it take any active part, in the preparation of the specifications, but it reviews the findings of committees to satisfy itself that the standards have been properly prepared, and finally it arranges for their publication and issue.

In addition, other objects of the association are enumerated in its charter as follows: (1) To coordinate the efforts of producers and consumers for the improvement and standardization of engineering products; (2) to promote the general adoption of engineering standards and to revise and amend such standards when necessary; (3) to register, use, and protect distinctive marks or names as applicable to materials or products which are in accordance with standards; (4) to make arrangements with Governments or other authorities to obtain from them privileges and concessions conducive to the objects of the association; (5) to appoint overseas representatives of the association; and (6) to do all such other things as the association may think conducive to the attainments of its objects.

The catalogue committee of the National Association of Bakery Supply Houses has just issued a mimeographed report based on the results of investigations carried on by the committee on what various organizations are doing to simplify catalogues. The committee is making further study of loose-leaf binders for salesmen's use and will probably supplement the report at a later date.

PRINCIPLES OF BUSINESS CONDUCT

The function of business is to provide for the material needs of mankind, and to increase the wealth of the world and the value and happiness of life. In order to perform its function it must offer a sufficient opportunity for gain to compensate individuals who assume its risks, but the motives which lead individuals to engage in business are not to be confused with the function of business itself. When business enterprise is successfully carried on with constant and efficient endeavor to reduce the costs of production and distribution, to improve the quality of its products, and to give fair treatment to customers, capital, management, and labor, it renders public service of the highest value.

We believe the expression of principles drawn from these fundamental truths will furnish practical guides for the conduct of business as a whole and for each individual enterprise.

1. The foundation of business is confidence, which springs from integrity, fair dealing, efficient service, and mutual benefit.

2. The reward of business for service rendered is a fair profit plus a safe reserve, commensurate with risks involved and foresight exercised.

3. Equitable consideration is due in business alike to capital, management, employees, and the public.

4. Knowledge—thorough and specific—and unceasing study of the facts and forces affecting a business enterprise are essential to a lasting individual success and to efficient service to the public.

5. Permanency and continuity of service are basic aims of business, that knowledge gained may be fully utilized, confidence established and efficiency increased.

6. Obligations to itself and society prompt business unceasingly to strive toward continuity of operation, bettering conditions of employment, and increasing the efficiency and opportunities of individual employees.

7. Contracts and undertakings, written or oral, are to be performed in letter and spirit. Changed conditions do not justify their cancellation without mutual consent.

8. Representation of goods and services should be truthfully made and scrupulously fulfilled.

9. Waste in any form of capital, labor, services, materials, or natural resources is intolerable, and constant effort will be made toward its elimination.

10. Excesses of every nature—inflation of credit, overexpansion, overbuying, overstimulation of sales—which create artificial conditions and produce crises and depressions, are condemned.

11. Unfair competition, embracing all acts characterized by bad faith, deception, fraud, or oppression, including commercial bribery, is wasteful, despicable, and a public wrong. Business will rely for its success on the excellence of its own service.

12. Controversies will, where possible, be adjusted by voluntary agreement or impartial arbitration.

13. Corporate forms do not absolve from or alter the moral obligation of individuals. Responsibilities will be as courageously and conscientiously discharged by those acting in representative capacities as when acting for themselves.

14. Lawful cooperation among business men and in useful business organizations in support of these principles of business conduct is commended.

15. Business should render restrictive legislation unnecessary through so conducting itself as to deserve and inspire public confidence.

ADOPTED BY THE UNITED STATES CHAMBER OF COMMERCE AND
RECOMMENDED BY THE IRON, STEEL, AND ALLIED INDUSTRIES OF THE
CALIFORNIA DEVELOPMENT ASSOCIATION

ELIMINATING WASTE IN DOMESTIC DISTRIBUTION

By F. M. SURFACE, *Assistant Director, In Charge of Domestic Commerce, Bureau of Foreign and Domestic Commerce*

The total domestic business operations of the United States probably amount to not less than \$80,000,000,000 annually. Economists tell us that from 10 to 15 per cent of that enormous sum represents avoidable distribution waste; that is, from 8 to 10 billion dollars which may be found in neither the distributor's nor the consumer's savings account.

Where do these wasteful leaks occur in the good ship distribution? Apparently on all sides—the entire hulk needs recalking. Wastes creep in from such places as excessive expenditure in sales promotive effort without adequate information as to prospects in a given market; unwise credit methods; unfair practices of small trading minorities; insufficient data as to national stocks of goods; disorderly marketing, particularly of perishables, with resulting gluts and famines; careless and injudicious procedure in the retail trade.

Large sums are needlessly consumed in unsystematized warehousing, extravagant delivery services, ill-judged advertising, and unwise installment methods.

Great wastes also exist in the physical movement of merchandise—in packing, handling, and transportation. It is estimated that we might ultimately, through standardization and interchangeability, save from 200 to 500 million dollars a year in simplified handling. And that is only one phase of physical distribution.

In view of the pressing need for elimination of waste in distribution, Congress in 1923 included in the appropriations for the Bureau of Foreign and Domestic Commerce the sum of \$50,000 for research into distribution problems. It was inevitable that this phase of the bureau's work should grow, as it has, by leaps and bounds until to-day there are being made regional, industrial, commodity, and functional surveys in many parts of the United States. As rapidly as appropriations are made available these investigations are being extended to other regions, industries, or commodities, where such assistance is requested.

As a result of the original bureau appropriation for research in domestic distribution, there was created the domestic commerce division, which has served as the center of the department's program of assisting American business to discover preventable wastes in domestic distribution. A description of the type of work being done by the domestic commerce division, therefore, will suggest some of the things that have been, or can be, done toward emphasizing the jingle of the cash register among the noises of industry and trade, and also toward converting distribution wastes into consumer savings.

REGIONAL MARKET SURVEYS

One of the major undertakings of the domestic commerce division is concerned with a series of regional market surveys aiming at an interpretation of the commercial structure of the United States. For the purpose of these surveys the country has been divided into nine regions based on differences in economic and business conditions.

Each survey report will discuss the influence of consumer differences upon trade in various parts of the area. The fundamental industries of agriculture, forestry, mining, fishing, manufacture, trade, etc., which form the sources of people's incomes and wealth, are likewise studied. Commodity movements and the machinery of distribution, wholesale and retail marketing areas, merchandising and credit trends, factors involving advertising appeal, store and plant location, nature of outlets, merchandising methods, buying habits, commodity preferences, and other factors are considered. All of these interrelated commercial facts are essential to an intelligent understanding of the region and to the planning of well-directed business operations.

The Commercial Survey of the Southeast was the first of this series of studies to be reported. The report on the New England Survey, comprising three volumes, is now being published. Findings on the Pacific Southwest region are being written, and field work has been undertaken in the Pacific Northwest and Gulf Southwest regions.

COSTING DISTRIBUTION

One factor which has contributed largely to the notable increase in manufacturing efficiency in the last two decades has been the development of cost accounting. The old system of trial and error has been replaced by accurate facts, and many wasteful production practices have been thus discovered and eliminated. The key to the practical use of cost accounting in manufacturing has been the study of the cost of producing individual items and of performing individual operations.

Relatively little progress has yet been made in analyzing distribution costs from the standpoint of the cost of handling individual items or performing individual services. The Bureau of Foreign and Domestic Commerce is attempting some work in that field. Investigations in wholesale and retail distribution for several lines of trade, including groceries, hardware, dry goods, paints and varnishes, electrical equipment, and specialties have been made. The purpose of these reports is not so much to provide

comparative data on operating costs or to specify wasteful practices, but rather to present a method for functional cost allocation which may easily be adopted by any member of the trade in determining the profitability of his own individual commodities, customers, or services.

Commodities are studied to distinguish slow-moving items from those with a profitable turnover, to relate their proportion of inventory outlay and space to their proportion of sales. In the wholesale grocery study, for instance, opportunities were discovered to reduce the number of inventory items by 50 per cent. In our study of grocery wholesale distribution costs we worked with a house then operating on a 10 per cent gross margin. Yet the principles developed in the study have been applied successfully in houses operating on both lower and higher margins and in houses handling both larger and smaller volume.

In the wholesale hardware study the record was given of a firm which had reduced its inventory items from 12,000 to 6,500, customer accounts were cut about 50 per cent to include only profitable accounts, the sales territory was reduced about 33 per cent, and yet the dollar volume of net profits was increased 35 per cent and operating expenses were reduced from 20 to 16 per cent on sales volume.

The major part of the work of a study of wholesale paint and varnish distribution costs has been completed. There is considerable evidence of need for standardization of discount practices in this one concern's sales transactions. Standardization and quality uniformity, so much a part of modern American business methods, seem to have been given little consideration in this line of commercial activity.

Opportunity for increased net return through the elimination of unprofitable order sizes has been another apparent conclusion pointed to by our several cost analyses. In the wholesale electrical equipment study, for instance, a rather unusual situation is disclosed. The jobber in that case not only loses money on small orders which do not pay for their own packaging and delivery costs, which has been found to be the case in other lines of wholesale merchandising, but a problem occurs also at the other end of the range of order sizes. From the evidence to date, it appears that the competitive bidding on orders of \$500 or more is so keen as to have led this jobber to pare his margin to perilously thin proportions.

We are also analyzing the records of a large wholesale dry goods house. The fallacy of reaching out for volume regardless of profit is indicated here as in previous investigations. Among other things, the study of this establishment has disclosed the fact that its salesmen cover 17 different States but secure more than 70 per cent of the concern's business from parts of two States. In other words, the salesmen cover an

additional 15 States to secure the other 30 per cent of the business.

THE LOUISVILLE GROCERY SURVEY

Another and outstanding effort toward the elimination of waste in distribution is the Louisville grocery survey being made by the domestic commerce division with the assistance of business interests both in Louisville and outside. This survey is probably the most comprehensive fact-finding investigation that has ever been undertaken with regard to the distribution of commodities. The work is divided into several different parts to cover the coordinated movement of merchandise from producer through wholesaler and retailer to consumer, as follows:

1. A detailed study of the cost of operation of eight wholesale grocers to determine the profit, if any, attaching to the maintenance of each customer account, the handling of each item of groceries, and the coverage of each part of their respective sales territories.

2. A detailed study of 28 retail grocers' distribution costs, likewise considering customers and commodities.

3. A census of food distribution to obtain from all types of wholesale and retail outlets for food products in Louisville such fundamental data as volume of business, average inventory, number of employees, salaries, and wages.

4. A study of credit methods and business mortality to determine why 30 grocers go out of business every month in that city—the object being to discover and thus enable the business man to avoid the economic wastes that lead to bankruptcy, which involves losses to both the distribution field and the consumer public.

5. As a further phase of the Louisville survey we plan to make a study of consumer demand—to discover, if possible, something more about consumer buying habits and preferences and how the housewife may best be served in the matter of packaging, commodity display, advertising, etc.

It is our hope that with so comprehensive an example as the Louisville grocery survey affords methods of cost analysis can eventually be simplified to the point where every distributor will regard them as so simple and yet so necessary that he will apply them to his own store, and to find out for himself what it is costing him to handle individual commodities, serve individual customers, and handle individual orders.

The survey of credit conditions and business failures among retail grocers in Louisville reports on the credit policy and methods of over 400 healthy and going concerns and examines the factors contributing to the condition of some 30 concerns on the verge of bankruptcy.

In order that the results of the Louisville credit and business failures studied may be given a comparative background, a study is also being made of credit

conditions in grocery stores of Philadelphia. Not only the causes of business failures are to be investigated, but there will also be obtained information on the proportion of failures settled in court and the relative cost of such settlement.

NATIONAL RETAIL CREDIT CONDITIONS

Of the staggering sum of not less than \$8,000,000,000 estimated to represent waste in distribution, \$1,000,000,000 is said to be attributable to credit losses. The desirability of keeping a watchful eye on credit practices to obviate preventable wastes is apparent. This fact has prompted another very important undertaking of the domestic commerce division—a national survey of retail credit conditions.

The proportion of the estimated \$41,000,000,000 annual retail business of the United States conducted on a credit basis is placed at \$24,000,000,000, with installment sales calculated at between \$4,000,000,000 and \$5,000,000,000.

The kinds of credit in use are not new, but some of their forms are new and the amount of consumer purchasing on credit is said to have been increasing greatly during these last eight years. Credit extension in certain trades has been exceptionally marked since 1920.

A material part of the costs of distribution come from the costs of extending credit to the consumers. Available data indicate that with up-to-date methods of credit scrutiny the actual losses from bad debts are not very heavy. When the costs of credit scrutiny, bookkeeping, and collections are included, however, the total costs of extending retail credit are heavy. The mark up on goods sold on extended credit is frequently very much greater than any normal interest charge on the outstanding payments. And yet the competition in this field is so keen that it appears certain that added costs to the consumers do not appear as added profits to the retailers.

Any unnecessary mark up in consumers' prices caused by charges to cover wasteful practice is a burden on all classes of business as well as on the consumer. Those retailers whose costs are abnormally high undoubtedly suffer. It is just as true that unnecessarily high prices discourage buying and reduce the sales of both manufacturers and farmers. Anything that will help to reduce the costs of extending retail credit will be a boon to consumers, retailers, wholesalers, manufacturers, and farmers.

The survey will show, for instance, by number, size, location, and class of store—department, chain, automobile, furniture, shoe, clothing, grocery, hardware, etc.—the losses due both to open account and installment sales, collection ratios, and methods of credit scrutiny.

Another type of data being obtained, which should be of considerable value to the merchant, is infor-

mation on the time that credit accounts are outstanding. One of the costs of credit extension is interest upon capital required to finance accounts. The lower the collection percentage the more money required to finance the business and the higher the costs, and, all other things being equal, the less the profits.

The data called for should enable the working out of correlations between credit losses and proportion of price represented as down payments in different lines of business. At present a merchant requiring a down payment of one-third of the sales price can resort only to trial and error methods to ascertain whether any variation in losses will be in proportion to the change in the down payment.

The survey solicits data on the percentage of goods sold on deferred payment which are later repossessed, detailed where possible by separate commodities, such as automobiles, furniture, and jewelry. The salvage value of repossessions will be similarly segregated by commodities, in comparison with total net sales of those lines.

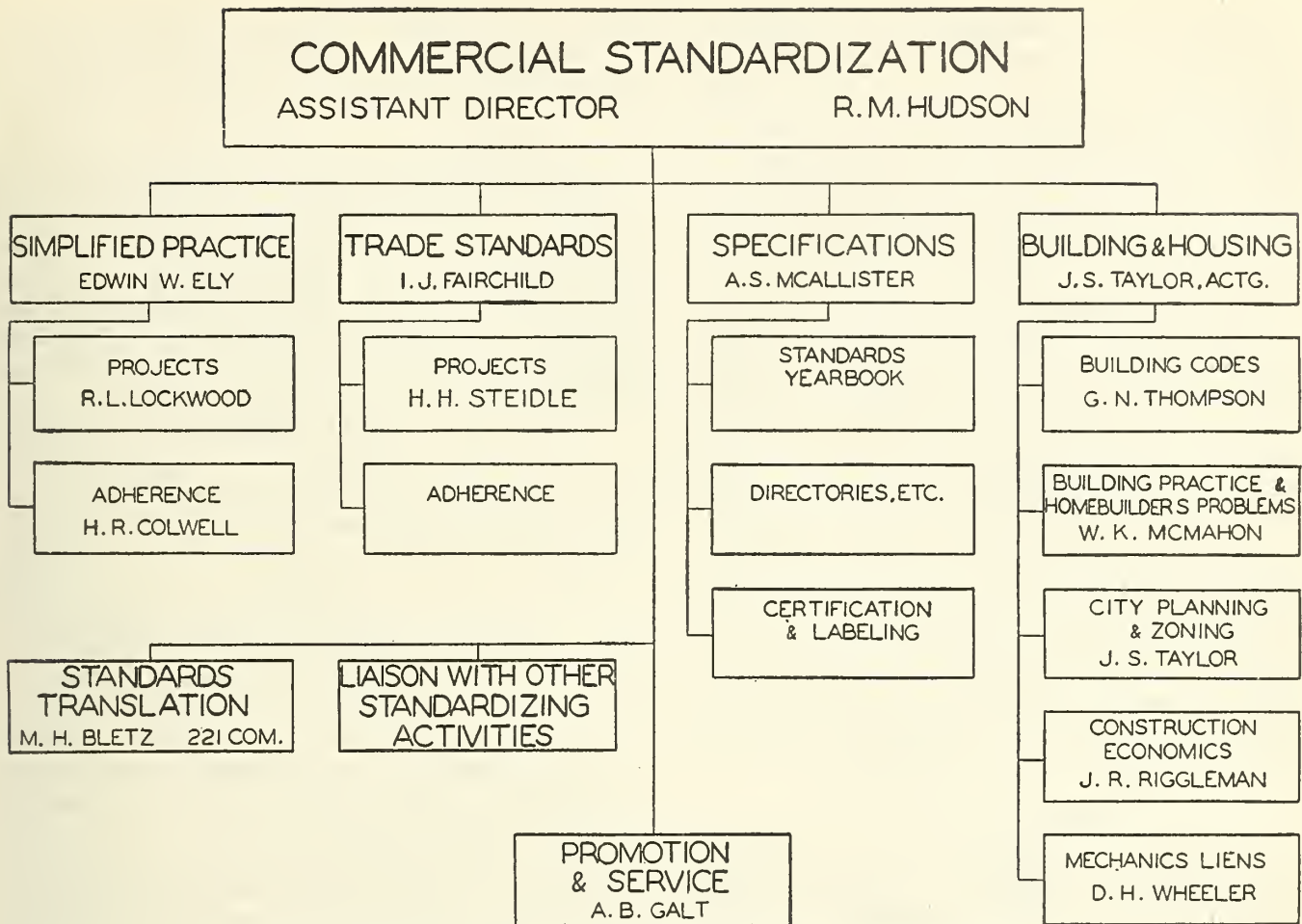
INDUSTRIAL EQUIPMENT AND INDUSTRY SURVEYS

What is the relation between the condition of productive equipment and profits? The replacement of machinery, which in point of service may have many years of usefulness, but which is incapable of satisfying the latest fancies of the consumer market or competing with more recent and improved machinery has been a difficult point for manufacturers and has prompted requests for a study of this problem.

The important phases of the industrial equipment studies are (1) to bring out facts showing the relation of equipment obsolescence to production costs, and (2) to discover, if possible, a means for correctly evaluating and providing for obsolescence in cost accounting. The first result is expected to be obtained by the study of machinery among manufacturers of the same. The second result is expected from an investigation among the users of such machinery.

The practical value of such studies will be, it is hoped, a truer accounting for obsolescence as a hazard rather than an arbitrary compromise as at present. Wear and tear, or depreciation, is a scientific movement and can be determined with some accuracy. Obsolescence is more nearly analogous to fire. As a risk it can not be predetermined any more than can the date a building will burn. An arbitrary basis of accounting for the two factors does justice to neither and fails adequately to provide a fund for replacing the machinery when its value has been destroyed by the factor of obsolescence.

As a part of this program, studies of industrial equipment of the knitted outerwear industry in and around Philadelphia and the wood-turning industry have been undertaken.



Organization chart of commercial standardization group of the Bureau of Standards

Although this is the first issue of this periodical in printed form it represents the fifty-second month of publication. (The previous issues have been in mimeographed and multigraphed form.) The designation hereafter will be by volume number and issue number, thus, Vol. 6, No. 1.

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In addition to the foregoing type of industrial survey, there are also related studies, such as that of the ensilage cutter machinery industry, designed to show the correlation between production, sales, and stock on hand of ensilage machinery, and to reveal past and present trends in consumption of and demand for particular sizes. An opportunity for simplification of products was suggested by the fact that 5 out of 17 sizes accounted for 80 per cent of the total ensilage-cutter sales of the concerns surveyed.

A second survey in this latter group covers the gray iron foundry industry, and provides every foundry man with a means of measuring his business with respect to such important factors, as capitalization, capacity, production, molding floor space, and number of molders employed. The ratio of capitalization, molding area, and molders employed to capacity was found to be fairly consistent by districts, but, on the other hand, failure to make adequate profits was reported in many cases as the reason for discontinuing foundries.

These two types of industrial surveys, it is hoped, will enable the elimination of wasteful practices with respect to equipment purchase and replacement and by pointing the way to coordination of productive capacity and output with market demand.

SPECIAL SERVICES TO BUSINESS

In addition to the domestic commerce activities already mentioned, there are a number of special services designed to promote profitable distribution practices.

The bureau attempts to act as a clearing house for business information particularly from governmental sources but also from many nongovernmental sources. Thousands of inquiries are answered each year which give to business men the benefit of information already available and applicable to their particular problem.

A weekly publication, *Domestic Commerce*, briefing significant domestic trade developments chiefly within the Department of Commerce and other Government organizations, is issued gratis to business executives, business libraries, and others concerned.

An annual publication, *Market Research Agencies*, lists all known research organizations in the United States and describes their activities and available studies. One obvious result is that much duplication of research effort is avoided.

A directory of commercial and industrial organizations, a study of trade association activities, a wholesale marketing atlas, and studies of retail store operating problems are also included in this group of special services which the bureau has furnished American business as aids for the elimination of distribution wastes.

OTHER IMPORTANT DISTRIBUTION AIDS

As before stated, the domestic commerce services of the entire bureau are developing rapidly. In-

cluded in the activities of other divisions are such as a survey of industrial traffic management, rail and inland waterway transportation studies, periodical reports on dealers' stocks and sales, and commodity distribution surveys.

The bureau's 29 district offices, located in as many important commercial cities in this country, are rapidly being organized as service stations for the American business man. Eventually it is planned to have capable experts in each of these offices who can discuss with a business executive his distribution problems and assist in bringing to his attention the latest pertinent information that is available.

The Bureau of Foreign and Domestic Commerce has also collaborated with the Bureau of the Census in taking the preliminary censuses of wholesale and retail distribution and of interindustry purchases and sales. These sample censuses were taken to determine the probable value and obtainable information in a national census of distribution—as is proposed for 1930. The value of such a census in providing comprehensive, basic information on domestic distribution can not be emphasized too greatly. It should provide for the first time in the history of any country definite data on commodity requirements in individual markets, types of outlet, relation of sales to inventory and sales effort, and innumerable related commercial factors.

Through such efforts as these the Bureau of Foreign and Domestic Commerce is attempting to assist American business to reclaim some of the country's \$8,000,000,000 to \$10,000,000,000 distribution waste for the benefit of producer, distributor, and consumer.

The compressive strengths of cast stone in the form of 2-inch cylinders, 2 inches long, have been found by the Bureau of Standards to vary within wide limits with an average value of 6,250 pounds per square inch.

On account of the increasing use of this product as a building material, there is a demand for knowledge of its physical properties, more particularly the resistance of weathering, so that acceptance specifications may be intelligently written. While freezing resistance as a measure of durability is a most important property, the bureau believes that it would be impracticable to have such a requirement in the specification. Determinations of those other properties, such as strength, absorption, etc., which can be made in a short time, and may possibly indicate freezing resistance, have been made to discover any possible correlation between them and freezing resistance. The freezing tests have only been partially completed, but results varying from complete destruction by 25 cycles to no sign of disintegration at 500 cycles have been obtained.

NEWS FROM THE DIVISION OF TRADE STANDARDS

(Formerly the Commercial Standards Unit)

CHANGE IN NAME

In view of increased work and responsibilities, and to avoid confusion with the commercial standards group, it is announced that the commercial standards unit will hereafter be known as the division of trade standards. This involves no change in function, and the printed publications will bear the same title as before, namely, Commercial Standards. The change in title is indicative of the growth of the work and the recognition of the former unit as a regular division of the Bureau of Standards.

LOWERED QUALITY FOR CHEAPER SELLING

The following statement was featured as a full-page advertisement in a recent issue of the *International Tailor*:

There is scarcely anything in this world that some man can not make a little worse and sell a little cheaper, and the buyers who consider price only are this man's lawful prey.

This illustrates the thought in the mind of the average reputable manufacturer of to-day who is seeking a means to stem the tide of items in his field made a little worse to sell a little cheaper.

Commercial standards, setting voluntary minimum limits for grade, quality, or measurements, established on a nationally recognized basis with the aid of the Department of Commerce and upheld by self-certifying labels or seals, are industry's most effective weapons against the decadent tendency of producing lower quality for cheaper selling.

The function of the division of trade standards is to assist industries in the establishment of commercial standards by serving, first, to bring together all organizations and parties at interest so that they may be heard and satisfied, as far as practicable, and, second, to promulgate and broadcast the specification voluntarily adopted by the industry as a minimum standard for grade, quality, or measurement, in order that such standard may enjoy nation-wide recognition and use. The service is available to any industry upon request.

WALL PAPER FACES THE LIGHT

In the backs of many minds linger unhappy memories of disappointing experiences with wall papers that were, perhaps, pretty when purchased but which proved unserviceable. It is assuring, indeed, to know that these unfortunate experiences need not occur again, since a beacon of quality is being set up by the industry to guide purchasers past the rocks of dissatisfaction in the selection and use of wall papers.

Appearance, eye value, æsthetic appeal—call it what you will—was the general basis on which wall paper

was formerly sold. Very few people knew anything of the quality of the material, and this phase of the purchase was usually left to the opinion of the paper hanger, who in many cases knew little, if any, more about it than his customer, and in any event naturally took the path of least resistance.

The continuance of this blind method of purchasing and the keen competition which tended toward reduced quality has had the effect of a boomerang on the industry. Dissatisfaction of consumers was communicated to friends and spread like the ever-widening ripples caused by a stone thrown into a pool of water, which naturally resulted in the increased use of other decorating materials.

Manufacturers realized that they must secure and retain the confidence of wall-paper users. They knew that unserviceable wall paper, regardless of its source, will have a damaging effect on the industry as a whole, and that enlightenment of the consuming public is the most effective means of protection against unsatisfactory wall paper. This is exactly the program to which all interests of the wall-paper industry are now offering support.

On May 25 a general conference was held at the Department of Commerce, Washington, D. C., at the request of producers, to consider the adoption of a commercial standard of quality on the basis of a specification formulated by the Wallpaper Manufacturers Association. This conference was composed of manufacturers of finished wall paper, paper stock, colors, and dyestuffs, as well as wholesale dealers, decorators, and users of wall paper.

This meeting marked the first concerted effort of all interests of the industry for the improvement of wall paper, and the results accomplished were very gratifying. Some minor changes were made in the recommended commercial standard, and several points were omitted pending further study.

The specification, with corrections, was unanimously approved by the conference and upon receipt of a satisfactory majority of acceptances from the industry the commercial standard will become effective August 1, 1929.

The specification is a minimum standard that covers the size of rolls and quality as reflected in the weight and nature of the raw stock, color fastness, hardness of printing, etc.

There will be no stifling of individuality in workmanship or design and no upper limit for quality. When buying a commercial standard wall paper, however, the purchaser has the assurance that such a paper will give satisfactory service.

To facilitate the procurement of commercial standard wall papers, the manufacturers will so label all

grades that meet the requirements of the specification. The Wallpaper Manufacturers Association plans to add its guaranty to such papers produced by members, so that the complete certificate will read something as follows: "This wall paper is guaranteed by the ——— Wall Paper Co. and the Wallpaper Manufacturers Association to meet all the requirements and tests as specified in Bureau of Standards publication entitled 'Wall paper—Commercial Standard CS16-29.'"

DIAMOND CORE DRILL FITTINGS

A report of the general conference of manufacturers, building contractors, and users held on May 27 at the Palmer House, Chicago, Ill., embodying a recommended commercial standard for diamond core drill fittings, has been mailed to interested organizations for their written approval. This recommended standard covers terminology, size designation, dimensions, and tolerances for drill rods, drill-rod couplings, core barrel bits, casings, casing couplings, and casing bits used in diamond core drilling, in order that these

items may be made interchangeable as produced by the various makers, thus facilitating replacement or extension of equipment and, in general, making it possible for the producers to better serve the drilling contractors and users. Copies of the report are available to interested organizations on request.

STEEL PIPE NIPPLES

Steel Pipe Nipples, Commercial Standard, CS5-29, is now available in printed form at 10 cents a copy from the Superintendent of Documents, United States Government Printing Office, Washington, D. C. It comprises a complete specification for this commodity, including dimensions, tolerances, threading, gaging, and chamfering, as well as stock sizes and lengths of the various grades. Single copies are available on request to organizations indicating their desire to scrutinize the commercial standard with a view toward adopting it as their standard of practice in the production, distribution, or consumption of this commodity.

RELIEF FOR PRESENT MARKETING DIFFICULTIES

By A. F. ALLISON, *Secretary International Association of Garment Manufacturers*

A manufacturing group, finding itself in difficulties, largely self-imposed, and facing increasing losses attending unethical practices, frequently fails to grasp the significance of the lack of authoritative and effective standards as a basis for marketing, which is characteristic of such a situation.

High costs and wasteful practices in marketing, to a largely unrecognized extent, are due to lack of established impartial standards for the products dealt in. Selling prices are only one factor in determining comparative values, and yet buyers in the wholesale markets, desiring to meet or beat competition, too frequently make low prices their only consideration.

Purchases of standard commodities measured solely by the pound or yard may be checked up accurately by Government standards set up for weights and measures. If we as purchasers are imposed upon, it is at least partly our own fault, as protection against weight shortage or inadequate yardage is readily available.

The public can not so readily protect itself against exploitation when accepted standards of quality, quantity, or other factors fixing commodity values are lacking.

When once established, merchandise standards can best be enforced by the consumer buyer, who has a continuing interest in the quality or comparative value of manufactured products. No manufacturer or distributor who skimps on value can escape paying the

penalty if the consumer possesses any easy means of identifying the offender.

In the garment industry a competitive evil, caused in part by distributor demand for lower prices, has been in the "skimp-cut" garment. This represents a saving in material and gives the unscrupulous producer and distributor an unfair price advantage, since the consumer buyer is never told the true reason why "skimp-cut" garments can be sold at lower prices than garments cut to full-size dimensions.

Competently managed, financially established manufacturers refuse to produce "skimp-cut" garments, recognizing this practice as shortsighted and offering no hope of permanent business connections. But at all times in the garment industry, as in many others, there is a certain number of marginal producers, incompetent or with insufficient funds, whose only idea is to sell their goods by means fair or foul. And, since the lowest price quoted in the highly competitive wholesale market sets the basis of comparison for all price quotations, it is increasingly difficult for self-respecting manufacturers and distributors to deal in terms of real comparative values.

However, in the garment industry there is no lack of experience and manufacturing information for the establishment of standards which will protect buyers and sellers against misrepresentation. Given the opportunity to call upon the United States Department of Commerce to act as an impartial agency in bring-

ing together representatives of the distributors and consumers for joint and mutual discussion and approval of the standards proposed by the manufacturers, what would otherwise be a costly and complicated proceeding becomes a comparatively simple and inexpensive though highly effective and authoritative proposition.

An opportunity to eliminate the uncertainties and waste which result from the sale of substandard merchandise or from the lack of public recognition and understanding of minimum critical standards for measuring the inherent value of a product is presented in the services of the division of trade standards (formerly commercial standards unit), National Bureau of Standards.

This opportunity is fourfold: (1) To fix the standards on a basis acceptable to and approved by representatives of the manufacturers, distributors, and consumers; (2) to provide ways and means whereby consumer buyers, as well as manufacturers and distributors, can readily identify all goods which conform to the standard; (3) to periodically audit the extent to which the standards have been adopted and survey the results secured; and (4) whenever found necessary or advisable to secure such modification or correction of standards as may be required to meet changing conditions.

The importance to the garment industry of the work of the division of trade standards can be most strongly emphasized by merely reciting the number of standardization projects which our association has completed or is carrying forward at the present time, including:

1. Boys' blouses, shirts, button-on waists, and junior shirts. The first standardization conference in the garment industry was held April 17, 1929, at the request of the National Boys' Blouse and Shirt Manufacturers Association, affiliated with the International Association of Garment Manufacturers, and resulted in the adoption of minimum standards of measurement for neck, chest, waist, length of back, front, yoke, sleeve, and cuff as approved by the manufacturers, distributors, and consumers.

2. Men's pajama coat and trouser measurements were considered at a conference held May 3, 1929, at the request of the nightwear manufacturers' division, I. A. G. M., with the same success met with in the previous conference.

3. Other garments on which standards are now being worked out by committees representing the manufacturers' organization are men's shirts; women's cotton dresses; men's sheep-lined coats and leather garments; men's and boys' work clothing, including suspender-back and waistband overalls, work pants, work shirts, riding breeches, work coats, combination suits, and play suits.

Among the features of outstanding significance in the work of the division of trade standards, the follow-

ing appeal strongly to the International Association of Garment Manufacturers:

1. As suggested by President Hoover during his service as Secretary of Commerce, this work is conducted strictly in harmony with the principle of self-government in industry. It does not involve governmental regulation or interference with private business. It does represent a service, available at request of manufacturers, distributors, or consumers, which can not be efficiently rendered by any private agency. Only the Federal Government in its various branches can undertake to maintain impartial relationships with all citizens, since it is supported by and represents all the different groups in the economic and social structure of the country.

2. In submitting proposed commercial standards designed for the guidance and equal protection of manufacturers, distributors, and consumers, the division of trade standards brings together for open collaboration in a public meeting the representatives of all three groups and, in addition, makes available the experience and suggestions of the research and technical personnel of the National Bureau of Standards.

3. The plan is efficiently rounded out and made effective through the certification plan and by encouraging the manufacturer to place on his product a tag or other mark of identification carrying the manufacturer's guaranty, backed by the organization representing his industry, that each article so tagged or labeled is made to conform to the commercial standard.

Since representatives of the distributors and consumers, as well as the manufacturers, participate in the formulation and adoption of the commercial standards, it is reasonable to expect that all three groups will cooperate in upholding the standards thus established.

The principal present limitations on commercial aviation are meteorological hazards. On the civil airways these are being overcome by the system of navigational aids which the Department of Commerce is installing. The radio aids in particular seem to be the solution of the problem of flying in fog. These aids are: (a) Communication, (b) course navigation, and (c) fog landing. Communication takes two forms—radio information broadcast to the airplanes on low frequencies by Government stations and two-way telephony maintained by the air transport operators at high frequencies. Radio course navigation has recently been made thoroughly practical by means of a radiobeacon giving service in every desired direction, operating a simple visual indicator on the airplane instrument board. Special adaptations of the beacon system give promise of facilitating landing during fog.

BUILDING AND HOUSING NEWS

BUILDING SPECIFICATIONS

The preparation of standard specifications for the general construction trades has been under way by the New York Building Congress since 1925 and has just culminated in the publication of 33 specifications approved by architects, engineers, trade associations, and other experts representing all of the elements of the construction industry.

The specifications describe approved methods of construction in accordance with present practices and conditions. They appear as the "New York Building Congress Standard Specifications, issue of May, 1929." The foreword by William Arthur Payne, chairman of the standards committee of the congress, states that they "are for the metropolitan district and have been written by an architect, and were carefully studied and indorsed by a committee of the New York chapter of the American Institute of Architects, and recommended by the chapter for use by the architectural profession. They have the written approval of the trade association where one exists in the industry, or by recognized experts, where there is no trade association. With this authority the specifications are issued as printed documents for the contract. By their general use the cost and uncertainties of estimating will be greatly reduced, and the causes of dispute lessened."

They have been given trials on representative building operations where their "clear, direct, and understandable wording" was commended. Although written expressly for the metropolitan district, they may find extended use, possibly with slight modifications, in all other localities in the United States.

The printed specifications are sold as separates numbered from 1 to 33 at very slight cost, and also as a bound volume, by the New York Building Congress, 101 Park Avenue, New York, N. Y.

The suggestion for the use of the standard specifications given by the building congress states:

A standard specification to be of value must be designed so as to be applicable to every type of building. Obviously the extent of the work in any trade division will vary with the individual building. Requirements regarding qualities of materials and workmanship may, within certain limits, be standardized. A very logical division exists between extent of work, or work included, and the quality of materials and workmanship.

The New York Building Congress suggests that specifications be divided into two parts, A and B—part A, specifying the extent of the work, to be written by the architect for each building; part B, describing quality of materials and workmanship, standardized as herewith presented.

These suggestions are followed by a brief outline form for part A enumerating the various items to be covered by the architect. They further state that when the standard specifications are used in this

manner they are to be bound with part A of each division and issued as a complete document. They further suggest that where architects prefer to rewrite each specification they can still obtain many of the advantages of a standard specification by copying the clauses verbatim and so stating.

The 33 types of materials or work are covered by part B, all or any number of which may be used as required by the particular job. Each of these separate specifications includes paragraphs on "general conditions," "arbitration clause," and "scope." The succeeding paragraphs in each case depend upon the particular trade covered. For example, those covering "excavating" are "examination of site," "unit prices," "examination of drawings," and "equipment, etc." Specifications covering such items as "mass and reinforced concrete" or "structural steel" contain, of course, many more items. At a meeting held on May 21, 1929, in New York these specifications were presented to a group of 50 prominent engineers, many of whom signified their intention of immediately making use of them.

A list of the specifications thus far available follows: Demolition; Excavating; Waterproofing by Bituminous Membrane; Waterproofing by Plastic Coatings; Masonry and Concrete Materials; Masonry; Mass and Reinforced Concrete; Concrete Arches and Fireproofing; Structural Steel; Cement Finish; Furnishing Granite, Cut Stone, Marble, or Manufactured Stone; Setting Granite, Cut Stone, Marble, or Manufactured Stone; Furnishing Terra Cotta; Setting Terra Cotta; Vault Lights; Mail Chutes; Caulking; Metal Window Frames and Sash; Roofing and Sheet Metal Work; Carpentry; Architectural Iron; Architectural Bronze; Metal Furring and Lathing; Plastering; Interior Marble, Slate, and Structural Glass; Terrazzo and Mosaic; Tile (Keramic); Hollow Metal Work; Metal Covered Wood; Glass and Glazing; Painting; Window and Door Screens; Weather Strips.

SANITATION AND PLUMBING

What happens to the wastes that are discharged into plumbing systems is a matter seldom given much thought by the average citizen. It is only when trouble develops in plumbing that its importance in relation to health and convenience receives attention. Yet our present-day civilization would be impossible without adequate means of conveying water to buildings and getting rid of waste products.

The difference between adequate and poor plumbing has not been so clearly demonstrated as similar differences in structural design. For the latter numerous tests on strength of materials and extensive research have produced formulas and methods calculated to furnish safe structures. In the case of

plumbing, however, judgment has played a larger part than demonstrable scientific fact. There has been room for large differences of opinion because in the case of waste and soil pipes there is a mixture of air and water delivered at irregular intervals and its exit from a building is controlled by such complex factors that extensive tests constitute the only method by which a firm basis for plumbing requirements can be established.

In recent years there has been a growing appreciation of the importance of the subject and tests have been conducted at various State universities and at the Bureau of Standards. The results of such tests were utilized by the subcommittee on plumbing of the Department of Commerce Building Code Committee in issuing its 1924 report submitting recommended minimum requirements for

plumbing in small dwellings. Later tests and observations of existing plumbing systems have been given consideration in the revised edition of this report recently issued which covers plumbing both in large and small structures. It is hoped that further experimental work will be possible to develop more facts and provide for every increasing efficiency and economy in plumbing.

Municipal officials, health authorities, and civic leaders generally will find a complete series of recommended plumbing requirements and much helpful information on the subject in the new report mentioned above, which is entitled "Recommended Minimum Requirements for Plumbing," and is obtainable for 35 cents, currency or money order, from the Superintendent of Documents, United States Government Printing Office, Washington, D. C.

STANDARDIZATION IN CONSTRUCTION

By JAMES S. TAYLOR, *Acting Chief, Division of Building and Housing*

When the words "standardization in construction" are mentioned there are occasional sensitive individuals who take fright as they remember rows of houses in mill villages, or in old subdivisions, that are all as alike as the peas in a pod. There are some, also, who think that but little progress has been made from the days when construction was a purely local undertaking, and at least 80 per cent of the materials came from local sources within a radius of a few miles. But others recall that Portland cement which meets a known standard has been available throughout the United States for more than 20 years, and that other standards were reasonably well known 40 or 50 years ago. They know that a good start has been made in the right direction; that the rate of progress in development and use of standards has been immensely speeded up during the past eight years, especially in connection with simplified practice agreements and reduction of dimensional varieties, and that each year and month sees a definite advance in the right direction.

The scores of different business, professional, and Government groups that are working for greater standardization in construction recognize that most buildings are put up to meet individual requirements of the owner, or have to meet special conditions of the site, or can use certain materials to special advantage because of nearness to the source of supply. Many are planned so that their appearance will be in general harmony with near-by structures and yet not contribute to a dull uniformity.

The objective in building up standards on a nationwide basis, is that the different groups connected with construction may do business with one another freely and efficiently. Great advances have been made

already, but in some respects the industry is still handicapped by a lack of adequate standards, and may be compared in some ways to a community in which there is no standard currency, where all coins must be assayed and weighed before a transaction is complete.

If an architect's plans call for doors that the builder finds are of unusual sizes in his locality, they may have to be specially ordered or made. The result may be not only extra expense, but delay in completion of the structure, unless the architect changes the size, and even that may involve a dozen conforming changes in other parts of the plan, which would also mean expense and delay. If the same species of lumber is known by different names in different regions, if first-class workmanship in a brick wall means something very much better in one city than in another—it all tends to keep the building industry on an inefficient localized basis. Confusion may also result when a contractor is asked to bid on a contract that uses phraseology and embodies conditions with which he is not familiar, and differences in customary practices as to credit terms often stand in the way of economical conduct of business.

Without attempting to give a complete discussion of the advantages of standards and the disadvantages of lack of standards to the different groups connected with construction, a brief discussion of the subject from the point of view of several of them may be helpful, especially since it throws some light on the complexity of the problems involved.

Architects and engineers working upon the design of structures in different cities or regions of the country must know something of the quality of the materials that they can obtain. The designer needs to know

the standard dimensions of steel beams, lumber, brick, and other units used in construction, and the common sizes of the pan forms used in constructing concrete floors.

The manufacturers and fabricators of materials must know what properties are demanded in structural materials, and in order to manufacture efficiently should be able to concentrate their efforts on a relatively small number of sizes and grades. Without adequate standards of quality, manufacturers of good materials would not be protected from competition by unscrupulous competitors.

Material dealers want to be able to buy materials that they know will meet the needs of consumers. In order to do this easily there must be uniform terminology, recognized standards of quality, and a concentration on certain common dimensional sizes.

Contractors, who are responsible for the purchase of materials and erection of buildings in conformance with specifications, are likewise interested in standards of dimension and quality, and particularly in standards of documentation. Standardization of contract forms and specifications greatly facilitates preparation of bids and understanding of the work to be done, and does much to help avoid disputes that may lead to lawsuits.

Subcontractors are affected in the same way as contractors by standards in documentation and in specifications governing the quality of work. "Many reputable subcontractors feel that when well-defined standards for finished work gain wider recognition they will not be called upon so much as at present to compete with others who skimp on quality of workmanship or of materials."

Equipment manufacturers stand to gain by standardization in building practices, since it permits them to develop lines of equipment to meet requirements of builders throughout the country. When standard sizes for concrete mixers, for example, are agreed upon, the manufacturers' resources can be devoted to the perfection of fewer types with the resultant economies of concentrated production. This gain also carries along to distributors of equipment, especially to the growing group of organizations which rent out equipment for particular jobs, often from a central headquarters which serves the need of various cities at a distance. Less capital is tied up in maintaining equipment that is infrequently used.

Adequate standards for particular materials are important to craftsmen in the building trades who use these materials in their work. If concrete work gets a "black eye" in a given city because one or more contractors have utilized poor materials or methods or have made it impossible for the men on the job to do their work satisfactorily, or if the cost of concrete is relatively high for one reason or another, as, for example, excessive requirements in building codes, then the cement workers may suffer. Men engaged in

building trades also have a direct interest in standards of practice in regard to safety precautions.

Owners are greatly benefited by standardization where its practice makes for low building costs. Beyond the first cost, they are directly concerned in standards of quality and workmanship which assure them buildings that will be durable and which permit maintenance at minimum costs. They are also interested particularly in having replaceable parts, such as windows, doors, plumbing fixtures, and builders' hardware, of standard dimensions and patterns which can be purchased from stock during succeeding years.

People generally are aware of the importance of structural safety and protection from fire hazards. If a theater in New York or Washington were to collapse or if its exits should prove inadequate during a fire or other emergency, persons from every State in the Union might be included among the killed and injured. A building that is improperly constructed may, when it burns, unnecessarily result in the destruction of adjoining buildings or of a whole neighborhood. If the plumbing in a single house is insanitary it may result in sickness not only for the occupants but in disease which spreads to a neighborhood. Hence, it is that there are in most cities building and plumbing codes designed to protect the public health and safety through requiring certain standards in the design and construction of buildings. Obviously the city government can not load up every building to see if it is strong enough, or ignite it to determine its qualities of fire resistance. It thus becomes necessary that it make certain rules, which are embodied in its building code. These rules may be of a rather general character or they may prescribe in great detail how different kinds of buildings are to be constructed. Practically all of them, however, specify minimum qualities which basic building materials such as concrete, brick, cement, and steel must meet.

In most ways building codes promote adherence to good standards, but in some cases, if not brought up to date in the light of new knowledge, they may stand in the way of progressive development. Building codes, however, can not ordinarily specify standard dimensional sizes. They may state that the studs in a wood house shall be not less than the nominal 2 by 4 inches, but this does not prevent a man using a size a quarter of an inch larger if he wishes.

In some respects the building industry has well-recognized national standards. Structural steel which meets the chemical and physical requirements named in the United States Government specifications, and those of the American Society for Testing Materials, may be bought in every community in the United States that is accessible to the railway or motor truck. Brick of a single size is made in every State of the Union. The standard contract documents of the

American Institute of Architects, indorsed by several other bodies, are used for buildings from Washington to Florida.

In other respects, however, the industry is distinctly local; plastering contractors in one city buy slaked lime; in another, quicklime. The common sizes of window sash differ in various regions, and there is a substantial production of at least 450 sizes.

It is evident from the preceding discussion that standardization in the building industry usually requires the cooperation of a good many different groups. As a practical matter, no group of manufacturers can arbitrarily tell the architects and engineers that they must confine their requests to a given size and quality of cast-iron pipe, or metal lath, or wall board, or whatnot. And the architects and engineers could hardly agree among themselves to specify only certain sizes or qualities without consulting the manufacturers and distributors, or their clients. As a matter of fact, the rapid progress that is being made in standardization in the construction industry has been through the joint efforts of many business, Government, and professional groups.

The American Society for Testing Materials has been in the field since about 1900, and, as far as its activities are related to construction, is concerned mainly with standards of quality. This organization, composed of individual members, has committees at work on most of the leading building materials, each committee having a majority of users, as distinguished from manufacturers, on its membership. Many of these specifications are worked out as the result of extensive laboratory research and field studies in which the work and staff of the Bureau of Standards often play a key part.

The A. S. T. M. specifications are generally recognized as standard in engineering handbooks, and many of them are incorporated by reference in municipal building codes. Hardly any steel-frame buildings of consequence, for example, are now erected of steel which does not at least meet the A. S. T. M. requirements.

An outstanding development of the past few years is the work carried on by the division of simplified practice of the Bureau of Standards in cooperation with manufacturers of building materials, distributors, architects, engineers, and other groups in eliminating excess dimensional varieties of building materials by means of voluntary agreements.

A great advance has also been made in the direction of more uniform building-code requirements, since the appointment by the Secretary of Commerce in 1921 of the Building Code Committee of the Department of Commerce. The recommendations of this committee, and of the subcommittee on plumbing, have been used in code revision work in more than 220 cities, and the number is growing every month as one city after

another undertakes the revision of its code—most local codes undergoing a fairly thorough revision at least once in every 5 to 10 years. The National Electrical Code and the National Electrical Safety Code, in the preparation of both of which the Bureau of Standards participated, have likewise had wide acceptance.

A number of groups represent owners of structures, such as the National Electric Light Association, which has also formulated standards for buildings of types used in power plants. Large corporations, such as chain stores, telephone companies, and railways, have also accomplished a great deal along this line, and the National Board of Fire Underwriters, through its engineering department, has done much to encourage proper construction from the point of view of fire resistance and human safety.

Many trade associations have done splendid work in the field of standardization in construction. Several of them have undertaken extensive programs of research as to the proper use of their materials in design and in the field. Some have promoted the training of apprentices in order that the supply of skilled journeymen capable of using their materials to advantage may be adequate.

The American Institute of Architects has a structural service committee, and many of its members cooperate with manufacturers of building materials in what is known as the producers' council, all with the aim of developing and applying standards for the manufacture and use of building materials. The American Institute of Architects has a standard filing system for technical material, so that manufacturers in distributing circulars can indicate on them their proper place in the architect's files.

The New York Building Congress, representing contractors, subcontractors, and material groups, labor, architects, and others, has developed standard specifications for different classes of work on large buildings.

The division of building and housing will aim to present each month in the Commercial Standards Monthly a list of important steps in the development of standards for construction, and this article has been prepared with a view to suggesting the far-reaching consequences and collective importance of the individual steps that are being taken.

Through the courtesy of the Superintendent of Documents, Government Printing Office, the Bureau of Standards is able to send each of the present list of subscribers of the Commercial Standards Monthly a complimentary copy of the July issue, the first of the printed edition. In order that our readers may not miss the August issue, which will have several articles of special interest, it is suggested that your subscription be placed at once. The domestic rate is \$1 and the foreign is \$1.25 a year.

DIVISION OF SIMPLIFIED PRACTICE

TIGHT COOPERAGE

Manufacturers, distributors, and users of tight cooperage and tight cooperage stock convened in St. Louis, Mo., on May 16, under the auspices of this division, to review the results of a variety survey which had been instituted and completed by the Associated Cooperage Industries of America.

The program formulated at that time recommends the elimination of 60 per cent of the current sizes of tight barrels and kegs, a reduction from 20 to 8 stock sizes. The program further recommends a reduction from approximately 122 sizes of staves and heads to 8, an elimination of 93 per cent.

A summary of the May 16 conference will be placed at the disposal of all who are interested in this project.

HOSPITAL PLUMBING FIXTURES

A general conference of representatives of plumbing-fixture manufacturers, hospital authorities, architects, and other interested elements in the industry, meeting at the Department of Commerce on May 22, approved a simplified list of stock sizes of hospital plumbing fixtures. If acceptable to a true cross section of the industry, this simplified practice recommendation will become effective at the close of the current year, with an additional year provided for the clearance of the eliminated varieties.

In the opinion of the conferees, adherence to this program, by all interests, will eliminate the immaterial differences that now characterize these fixtures. Differences which unreasonably increase overhead production costs, and which levy upon the hospitals charges that are incommensurate with the results obtained, it is believed, will be eliminated.

STORAGE TANKS FOR GASOLINE AND OIL

A representative of the division addressed a meeting of the Eastern Steel Tank Institute, on June 7 in Cincinnati, Ohio. The ensuing discussion crystallized the opinion of the members relative to the practicability of eliminating the odd sizes and dimensions of storage tanks for gasoline and oil. The institute appointed a simplified practice committee to make a study of existing conditions, with a view to eventually drafting a simplified practice recommendation for the guidance of all interests.

INDUSTRIAL TRUCK TIRES

A general conference of manufacturers, distributors, and users met in the Department of Commerce on June 6 to approve a simplified list of industrial truck tires which had been prepared by the manufacturers of this commodity. The proposed schedule, as modified by the conference, will be mailed to all interests for their consideration and signed acceptance.

INDUSTRIAL TRAILERS

The results achieved through the simplification of industrial truck tires, and the currently active variety survey in connection with industrial casters, have stimulated an expression of opinion by users of industrial tractors and trailers regarding the practicability of simplifying the individual parts of trailers. This observation exemplifies the interest that consumers in general are taking in the simplification movement, and their willingness to voluntarily assist manufacturers to eliminate avoidable waste.

TEXTILE MACHINERY PARTS

Parts of textile machinery, such as bobbins, quills, paper cones, and tubes, spindles, etc., constituted the agenda of a preliminary conference of manufacturers of textile machinery with the division in New York, N. Y., on June 6. All branches of the industry were represented.

The discussion of the opportunity for simplification in this field revealed the fact that there now exists an unusual amount of diversification in sizes of the parts above enumerated. It was the unanimous opinion of those in attendance that simplification holds potential benefits for the textile machinery industry, and that a detailed study of the current situation was desirable. To the end that the necessary facts may become available, the conference appointed simplified practice committees to inaugurate appropriate surveys as the first step in the direction of eliminating superficial differences in variety.

SHOE GORING

The variety survey concerning shoe goring having been completed, the simplified practice committee of the manufacturers has requested the division to organize a general conference of all interests to approve the proposed simplification of shoe goring. The conference has been called for July 23, 1929, at the Hotel Belmont, in New York, N. Y.

EARPHONE BATTERIES

This project is concerned with batteries that provide the electric current actuating microphones and earphones used by people whose sense of hearing is impaired. The need for simplification in this field has been emphasized by a representative manufacturer. It is the opinion of that manufacturer that the establishment of a simplified list of varieties of earphone batteries would be beneficial as follows:

1. Concentration upon the recommended varieties would bring about a lowering in production costs.
2. The simplified line could be carried in stock in anticipation of a known predetermined demand, with consequent increased service to the consumer, both as regards expeditious delivery and convenience of replacement.

3. Increased production of an adequate line of batteries would be conducive to improving the quality of product and would stimulate the development of that type of battery best suited for earphone operation.

A preliminary meeting of manufacturers of earphones and manufacturers of earphone batteries met in New York City on May 21, to consider this proposal. In consequence, a simplified practice committee was appointed by the conference to conduct a factual survey upon which might be based a definite simplified practice recommendation.

It was the sense of the meeting that the committee should (1) study the opportunity for effecting a reduction in the variety of special-shape batteries, (2) consider the adoption of uniform battery-terminals, and (3) that thought be directed to the ultimate selection of a unit cell for use in batteries of different capacities, for use with earphones.

MASONRY OPENINGS

A meeting of manufacturers of steel windows and steel window appurtenances, producers of supplementary materials, and architects discussed the subject of masonry openings at the Bureau of Standards, on June 12. It is the present belief of the industry, as expressed by this conference, that real benefit would attend the establishment of a simplified list of dimensions for masonry openings. Such a list, based upon definite increments in width of opening and height of opening, should be eminently practicable as a guide to all who have anything to do with the original construction of buildings and the ultimate care thereof.

THE APPLICATION OF SIMPLIFIED PRACTICE RECOMMENDATIONS TO GOVERNMENT PURCHASES

The promotion and use of the simplified lines, when established by industry in cooperation with the Department of Commerce, has proven to be one of the most successful achievements of the division of simplified practice.

The unit of that division devoted to the actual application and use of a given simplified practice recommendation, is constantly in touch with the industry concerned through its representative standing committee. Not alone are their efforts directed toward conformity on the part of industry, but constant contact with the purchasing officials of the Federal Government has become necessary and essential so as to insure Federal purchases in terms of industrial standards.

There is no question but simplified practice recommendations have become a most important factor in the general movement for the elimination of waste in the commercial field. It is obvious, therefore, that these simplifications which are developed as the best practices for American industry should likewise be the best practices for the Government which represents it.

More and more Government purchases are conforming to the 100 simplifications now in effect. The valuable assistance rendered by the Chief Coordinator in the interest of governmental adherence to industrial simplification is evidenced by Bulletin No. 109, Supplement No. 2, issued by the Chief Coordinator and obtainable through the division of simplified practice of the Department of Commerce.

MONTHLY NEWS—AMERICAN MARINE STANDARDS COMMITTEE

PUBLICATIONS

The following printed publications containing promulgated American marine standards have just been issued and will be distributed at an early date: AMSC56—Ship Scupper and Drains. AMSC57—Chinaware for Ship Equipment—Kinds and Sizes. AMSC58—Lifeboat Disengaging Apparatus—General Specification. Copies are now available from the Superintendent of Documents, Government Printing Office, at 5 cents each. A list of all marine standard publications issued to date is available upon application to the secretary American Marine Standards Committee.

SHIP JOINER HARDWARE

Proposed standard specifications have been developed for the following: Rim lock for heavy doors; rim lock for light doors; reverse-bevel rim lock for wood or hollow metal doors; regular-bevel rim lock for wood doors; mortise lock for ordinary swinging

doors; mortise lock for sliding doors; half-mortise lock for sliding doors; rim lock for wardrobe doors; rim lock for cupboard doors; mortise dead lock; drop-ring handles for the heavier door locks. Ship door bolts of the barrel, straight, neck, flush, and spring latch types. Ship sash hardware comprising meeting rail sash lock; spring bolt sash fastener; pawl sash catch; hook sash fastener; antirattler—cam type; antirattler—screw type; two types of flush sash lifts, hook sash lifts, and sash pivots. Preliminary drafts of these specifications have been submitted to the Technical Committees on Hull Details and on Ship Operation Details, and the Subject Committee on Joiner Hardware.

PORT FACILITIES

The Technical Committee on Port Facilities has been definitely formed with 16 members representing diverse port interests on the Atlantic, Gulf, and Pacific coasts as follows: Chairman, Charles H. Gant, manager and secretary, Board of Harbor Commissioners,

Wilmington, Del. Members: M. E. Arkills, safety engineer, Waterfront Employers of Seattle, Seattle, Wash.; Willard C. Brinton, president, Terminal Engineering Co. (Inc.), New York, N. Y.; W. Scott Hammond, engineer assistant to general manager, Board of Commissioners of the Port of New Orleans, New Orleans, La.; Robert A. Leshner, executive engineer, New York-New Jersey Business Associates (Inc.), Jersey City, N. J.; F. C. Marron, treasurer, the American Association of Port Authorities, Seattle, Wash.; George F. Nicholson, harbor engineer, Los Angeles Board of Harbor Commissioners, San Pedro, Calif.; Gen. William L. Sibert, chairman and chief engineer, Alabama State Docks Commission, Mobile, Ala.; C. U. Smith, harbor terminal director, Board of Harbor Commissioners, Milwaukee, Wis.; Harry E. Stocker, resident manager, McCormick Steamship Co., New York, N. Y.; Maj. Dan I. Sultan, Corps of Engineers, United States Army, resident member, the Board of Engineers for Rivers and Harbors, Washington, D. C.; Carroll R. Thompson, chief engineer, Department of Wharves, Docks and Ferries, Philadelphia, Pa.; H. M. Thompson, secretary, Hampton Roads Maritime Exchange, Norfolk, Va.; J. Russell Wait, general manager, the Port Utilities

Commission, Charleston, S. C.; Frank G. White, chief engineer, Board of State Harbor Commissioners, San Francisco, Calif.; George B. Wright, freight traffic manager, Detroit and Cleveland Navigation Co., Detroit, Mich. The functions of this committee are: (a) To propose standards relative to port facilities and to furnish available data to help in their development, (b) to form or approve subject committees if required to develop such standards, (c) to advise the subject committees when necessary and to review their work, and (d) to vote upon proposed standards before their submittal to the membership and others concerned for critical comment and to the executive board for promulgation. A tentative program has been outlined to the committee and it is expected that development of proposed standards will begin at an early date.

PROPELLER SHAFT COUPLINGS

Proposed alternative standards for sleeve couplings for propeller shafting of sizes from 5 to 18 $\frac{3}{4}$ inches have been approved by the Technical Committee on Engineering Details and are now before the membership for critical comment before taking steps to promulgate them.

NEWS FROM THE DIVISION OF SPECIFICATIONS

EXPANSION OF CERTIFICATION PLAN

Lists of "willing-to-certify" manufacturers, as sources of supply of commodities covered by certain United States Government master specifications, are now being distributed to all important governmental and institutional buyers, Federal, State, county, and municipal; that is, all who are making purchases out of tax money or its equivalent. Copies of these lists in their present or revised form will be sent to officers of trade associations, technical societies, and other interested organizations for their information and for criticism and comment. Subsequently, copies of the lists will be sent to a relatively small number of other individuals or firms upon specific request. Work is now going forward actively in expanding the certification plan to include 8 Government master specifications for heat-insulating materials, 3 for medical and surgical supplies, 9 for abrasive and polishing materials, and 8 commercial standards for various commodities shown in the accompanying lists:

Heat-insulating materials:

- 54. Asbestos millboard.
- 158. Hair felt.
- 211. Magnesia asbestos plaster.
- 212. Magnesia molded pipe covering and blocks.
- 284. Gypsum wall board.
- 285. Gypsum plaster board.
- 337. Compressed cork (cork board).
- 338. Ground cork for insulating purposes.

Medical and surgical supplies:

- 356. Dental amalgam alloy.
- 357. Boilable catgut ligatures (surgical catgut suture material).

Abrasive and polishing materials:

- 340. Polishing paste.
- 341. Liquid metal polish.
- 385b. Paper, flint.
- 386a. Paper, garnet.
- 387b. Cloth, abrasive, aluminum oxide.
- 388b. Cloth, emery.
- 390. Polish, silver.
- 582. Paper, abrasive, artificial, waterproof.
- 583. Paper, garnet, waterproof.

Commercial standards:

- 1. Clinical thermometers.
- 3. Stoddard solvent.
- 4. Porcelain plumbing fixtures.
- 5. Steel pipe nipples.
- 6. Wrought-iron pipe nipples.
- 10. Brass pipe nipples.
- 11. Mercerized cotton yarn (regain).
- 12. Domestic and industrial fuel oils (for use in oil burners).

DIRECTORY OF GOVERNMENTAL TESTING LABORATORIES

As a result of a request from the War Department, the Chief Coordinator has arranged with the Bureau of Standards to prepare a classified list of all governmental laboratories and facilities available for testing supplies and materials for purchasing units of the

various Government departments. Questionnaires for use in compiling data relating to the kinds of commodities which the various Government department laboratories can test and the types of testing equipment in the laboratories were submitted to the chief purchasing officers of the departments and establishments to inform these officers of the activities being undertaken in connection with the compilation of the classified list of laboratories and to check the accuracy of the mailing list of the laboratories. The Directory of Governmental Testing Laboratories will supplement the Directory of Commercial Testing and College Research Laboratories, which is now in its third edition. Information will be given concerning not only the kinds of commodities which each laboratory can test but also the types of testing equipment in each laboratory and the routine procedure involved in obtaining authority for the laboratory to assist purchasing officers in making tests and furnishing results relating thereto. The great amount of available information relating to the testing facilities of the laboratories of the several departments of the Government necessitates a laboratories directory considerably more elaborate than at first expected. The major part of the manuscript for this directory is now in final form for mimeographing, which itself is a large task.

LABELING OF BUILDING MATERIALS

A most significant movement now under way in the merchandising of building materials is the grade-marking and trade-marking of softwood lumber in accordance with American Lumber Standards. The purpose is to guarantee to consumers that such labeled lumber is manufactured and uniformly classified according to standard dimensions and grade. It involves the placing on each piece of softwood lumber the insignia of the organization and a symbol showing the grade. At the conclusion of its annual convention in Buffalo on June 6 the National Association of Purchasing Agents indorsed the grade-marking of lumber as being of benefit to all buyers, and recommended that purchasers give preference to such grade marked stock. The labeling program as now being actively carried on by the National Lumber Manu-

facturers Association has been indorsed by the National American Wholesale Lumber Association as promoting the use of lumber "in a most helpful and satisfactory way." The National Retail Lumber Dealers Association, which is cooperating in the movement, issues an additional guaranty relating not only to lumber but also to other building materials, by what is termed a "certificate of safety," guaranteeing that all building materials delivered are of the quality and quantity invoiced and that the classifications or grades of the items listed in the invoice conform to the grading or classification rules of the associations of manufacturers of the various products named in the invoice. The movement is also in harmony with the recent action of the executive committee of the National Builders Supply Association, which, by a unanimous vote, adopted a resolution requesting the manufacturers of sewer pipe, hollow tile, flue lining, and coping to mark their products with grades as well as with brands. The committee has also requested that sewer pipe and wall board be similarly designated.

STEEL

The May, 1929, issue of the Transaction of the American Society for Steel Treating reports that the recommended practice committee has released a tentative general recommendation for heat treating tool steels. This practice, however, is not issued as a specification and should not be interpreted as such. It will remain tentative for at least a year until adopted by the board of directors and the committee of the A. S. S. T.

WOOD PRESERVATIVES

Under date of May 1, 1929, the American Wood Preservers' Association issued supplements to its Manual of Recommended Practice containing the following standard specifications: Preservative treatment of trunking and capping by pressure processes, preservative treatment of pole butts by the nonprocess-incising method, preservative treatment of pole butts by the nonpressure process-nonincising method, and preservative treatment of Douglas fir lumber by pressure processes. In addition, it has issued seven revisions of existing standards relating to wood preservatives.

COMMITTEE ON WOOD UTILIZATION

At the request of representatives of the Federal Government, public utilities and private companies interested in wood construction in the Tropics, the National Committee on Wood Utilization of the Department of Commerce, has undertaken the study of the best practices to be followed to protect wood construction in the tropical zones from termite damage.

This request comes as a result of a meeting called by the committee in March to consider wood construction

in the Tropics, which was attended by representatives of the groups above mentioned interested in the use of millions of feet of American lumber there.

According to Dr. Thomas E. Snyder, who has charge of termite investigations for the Department of Agriculture, wood as a construction material is rapidly losing ground in the Tropics, owing to losses resulting from termite destruction. Despite the fact that the tropical climate frequently favors the use of well-

ventilated and substantially constructed wooden dwellings, because of a combination of low cost and the protection they afford the occupants against heat and dampness or for some other reason, many important wood users have temporarily abandoned wood, although their preference is for wood construction.

It is with the knowledge that wood intended for construction in tropical countries may be rendered resistant to the attack of termites or white ants, if certain approved construction methods are followed, that the committee is undertaking the requested study. The results of its investigations will be incorporated in a bulletin to be issued by the committee.

"The volume should immediately find acceptance as a comprehensive, reliable, and authoritative treatise on the subject and should be of the greatest value to students of architecture and engineering, contractors, construction engineers, construction superintendents, and all progressive men connected with the lumber industry." This is the way N. Max Dunning, a prominent Chicago architect, characterizes *Wood Construction*, the handbook on the properties of wood and its uses in construction recently issued by the National Committee on Wood Utilization of the Department of Commerce.

This work is the most complete of its kind ever attempted. Its preparation was based on the fact that no authoritative textbook on wood construction has heretofore been available. It contains more than 700 pages and almost 500 illustrations. Information collected from a great diversity of sources is incorporated in this handbook, which was prepared for the consumer by the consumer. Literally hundreds of architects, builders, contractors, and engineers cooperated in furnishing the latest available information regarding practices and methods of wood construction much of which has never been published before.

Through this manual the lumber manufacturer may gain a clearer knowledge of the requirements of the ultimate consumer and will better understand how to adjust his manufacturing and sales efforts. For the lumber distributor, who comes into direct contact with the architect, the engineer, the contractor, the builder, and the prospective home owner, the book contains practical suggestions which will enable him to broaden his knowledge of the suitable uses of wood and accordingly expand his services. Bankers, building and loan associations, and lawyers interested in investments involving buildings and other types of construction will find just the information they need to aid them in passing upon applications for loans on frame structures. Design and construction of buildings and other structures are among the subjects of particular interest to engineers, architects, contractors, and builders.

The book discusses, among other subjects, the species of wood, their relative properties, availability, and principal uses; identification of woods; wood-preserva-

tive treatments, with special reference to the prevention of decay and insect damage; painting, staining, and wood finishes; fireproofing of wood; the fundamental principles involved in the application and methods of framing wood in all of the important types of construction; and grade-marking of lumber. Close attention has been given in the preparation of the manual to the recommendations of the National Committee on Wood Utilization covering good wood-using practices, from those on short-length and end-matched lumber to those on quality guaranty and grade-marking. Already a number of leading educational institutions have expressed their intention to adopt *Wood Construction* as a textbook. This manual may be secured on application to the National Committee on Wood Utilization, Department of Commerce, Washington, D. C. The price is \$6.

A plan characterized by the Pittsburgh Post-Gazette as "a way to bring small boys, empty packing cases, and carpenters' tools into partnership for the general good" has been developed by the National Committee on Wood Utilization of the Department of Commerce.

Under the title "You Can Make It" the committee has just issued a booklet, simply written and copiously illustrated, which shows more than 100 ways of transforming discarded boxes and crates into interesting and useful articles for the camp, garden, and home.

Such organizations as the Boy Scouts, the Boys' Club Federation, the Playground and Recreation Association of America, Vacation Church Schools, Junior Achievement (Inc.), 4-H Clubs, and similar groups have pledged cooperation with the National Committee on Wood Utilization in its project.

The object behind the committee's project is to prevent at least a part of the waste of secondhand containers, most of which are either burned or thrown away after they have served their original purpose.

Practically every commercial establishment, the committee points out, has boxes or crates which it is willing to dispose of at little or no cost. The only reason why these containers have not been more universally utilized in the past is because no individual or organization has taken the initiative in calling attention to them, suggesting ways and means of putting them to good use, and taking steps to see that they were put into the hands of persons who could use them. This the committee is now trying to do.

When it is understood that the total annual quantity of lumber used for box and crate purposes would, if suitable for construction use, build a city of frame houses four times as large as the Nation's Capital, the practicability of the committee's project is apparent.

As evidence of the widespread interest aroused in its project the committee reports that over 70 different and distinct types of organizations have already made inquiry regarding the project.

USE OF SPECIFICATIONS WELCOMED

The use of specifications where possible in ordering material not only permits the purchasing department to buy economically, but speeds up delivery and eliminates troublesome questions as to fitness of material for use and possibility of holding indefinitely, while these questions are being threshed out, in the meantime procuring additional supply, said O. A. Donagan, general storekeeper for the Boston & Maine Railroad, in his recent article which appeared in *Railway Purchases and Stores* under the title of *Functioning of the Service of Supply*.

That purchasing agents believe this true is attested to by the fact that the Purchasing Agents' Association of Philadelphia have adopted resolutions in which the association stated that the purchasing agents believe that the necessity for purchasing patented articles and for specifying branded articles or equal could be almost eliminated if the United States Government or other nationally recognized specifications were used whenever possible.

Interest in specifications is not limited to any one group of industry, as stated by Ernest C. Morse, of the Cotton Textile Institute, before a meeting of the American Society for Testing Materials, when he pointed out that there was a live and steadily growing interest in the subject of specifications in the cotton-textile industry.

"Specifications are important to manufacturers who are seeking to eliminate waste through standardization, simplification, and other measures," he said, and also called attention to the fact that "consumers are interested in this subject."

"They (the consumers) are looking for the advantages that they may derive either as individuals or industries. It is just as essential for the producer to know how and where his products are being used as it is desirable for the consumer to be assured that the fabrics he is using meet certain specified and reasonable requirements."

One naturally expects industry to indicate in some way that the goods are produced in accordance with approved specifications. In other words, how can one distinguish between reliable and unreliable made goods?

The lumber industry is answering this question through grade marking of lumber, as the *Lumber Trade Journal* points out, "How can one distinguish good lumber from poor lumber?" Taking as its subject *Lumber Easily Identified*, that magazine editorially answers that that "is a sensible question—one of much importance to household happiness—and it can be easily, practically, and satisfactorily answered." This answer is supplied by American Standard Lumber (*Simplified Practice Recommendation No. 16*).

"The primary purpose of these standards is to enable the average buyer of lumber to intelligently, effectively, and economically classify it; to select proper grades and sizes of lumber for specific uses, with full assurance that he is getting the best for the purpose intended. Public interest and public protection against shoddy construction, through the substitution of poor grades for good ones, as well as prevention of the use of expensive grades where lower-priced ones would assure an equally durable structure, motivated the formulation of American lumber standards."

Such praise for the certification and labeling plan as developed by the division of specifications of the Bureau of Standards is not confined alone to American industry and American publication, but the movement has spread even to those shores across the waters.

Dr. George K. Burgess, Director of the Bureau of Standards, has received a letter from W. Rayner Hebblewhite, general secretary of the Australian Commonwealth Engineering Standards Association, in which the latter expressed his appreciation for data on our certification and labeling plan that had been forwarded.

"These plans," wrote the general secretary, "will be extremely valuable to us in initiating our certification scheme in Australia. In view of the rather special conditions in Australia, by reason of the large proportion of purchasing done by the Government departments, we are combining with our certification lists, corresponding lists of purchasing authorities, who have agreed to adopt standard specifications as the basis of their purchasing. These general lists, combined with the certification lists for the individual specifications, are expected to bring about a substantial increase in the adoption of Australian standards, and in the advantages that will result therefrom. The experience gained in America, which has been so freely made available for our guidance, is proving of the greatest assistance to us in our work."

We also find that Germany is taking up the matter of certification and labeling of goods. According to a recent report received from George P. Waller, Department of Commerce consul at Dresden, about 15 German organizations, representing manufacturers, distributors, and consumers of linen and linen mixtures, have agreed on a system of standards for the marking and sale of linen textiles and textiles containing linen. This movement, according to Consul Waller, is a result of the harm which, it is claimed, has been done among the buying public during the last 10 years due to lack of official standards. It is said that many buyers purchased material as linen which contained very little of the pure yarn. Others have bought mixtures which were largely cotton.

NATIONAL SCREW THREAD COMMISSION REPORT

The third report of the National Screw Thread Commission has just been issued as Miscellaneous Publication No. 89, of the Bureau of Standards, and will be found of great value to mechanical engineers and all others interested in the fitting together of threaded parts.

The designation of the screw-thread standards promulgated by the commission has been changed from "National" to "American National." The basic dimensions for the coarse and fine thread series, and the tolerances and classification of fits, remain practically unchanged from the 1924 report.

Other important revisions of material in previous reports are: The addition of sizes above $1\frac{1}{2}$ inches to the fine-thread series, but with coarser pitches than those originally published in the progress report of 1921; increase of the tolerances on minor diameter of nut, over the range of sizes smaller than $1\frac{1}{8}$ inches, of the coarse and fine thread series; the insertion of the 3-inch- $3\frac{1}{2}$ threads-per-inch size in the coarse-thread series; the substitution of tables of specific pitch diameter tolerances for threads of special diameters, pitches, and lengths of engagement in place of the method of determining such tolerances by adding together increments, thus establishing consistency with the pitch diameter tolerances specified for the regular thread series; and revision of head proportions of wood screws.

New material added to the body of the report includes the following specifications: Wrench head bolts and nuts and wrench openings; other screw, bolt, and nut proportions by reference to certain specifications of the American Standards Association and the Federal Specifications Board; an outline of standard practice for A. C. M. E. screw threads; screw threads for oil well drilling equipment, including pipe, casing, line pipe, cable drilling tool joints, rotary drilling taper joints, cold-drawn and machined working barrels, and sucker rods by reference to specifications published by the American Petroleum Institute; standard hose connections for welding and cutting torches; rolled threads for screw shells of electric sockets and lamp bases; and a 12-pitch thread series. The specifications for pipe threads are carried over in this report in their original form pending completion of the work of the new A. S. A. sectional committee on the standardization of pipe threads.

New material added to the appendixes, besides that mentioned relative to threading tools, includes the following as useful information: Standard designs of plain and threaded plug and ring gages; specifications covering class 5, wrench fit for threaded studs; common practice as to thread series and class of fit for screws, bolts, and nuts; and wire methods of measurement of thread thickness of A. C. M. E. threads.

Copies of this report may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 50 cents each.

Bureau of Standards Circular No. 341, Use and Care of Automobile Tires, presents useful information relative to tires in general and points out certain precautions, the observance of which is essential to the proper use and care of tires. Brief reference is made to the essential characteristics of fabric tires, cord tires (high pressure and balloon), inner tubes, cushion tires, and solid tires. Detailed instructions are given for the mounting of pneumatic tires. Recommended loads and inflation pressures for pneumatic and solid tires are given in tables, and the general subject is discussed at some length, with special reference to the injurious effects of overloading and underinflation. The various types of injury to tires and their causes are illustrated and described, and recommended instructions are given for the use and care of tires in general. The circular is concluded with a list of general suggestions, as follows:

- (1) Keep tires properly inflated; (2) do not run a "flat" tire farther than is absolutely necessary; (3) see that wheels are in correct alignment; (4) remember that oil, grease, sunlight, and heat are injurious to rubber; (5) spare tubes carried in car should be wrapped or otherwise protected; (6) avoid the use of rusty or bent rims; (7) if it is necessary to use chains, apply them loosely; (8) cut loose slivers from solid or cushion tires—have cuts in pneumatic tires promptly repaired; (9) adjust brakes so that they operate evenly on all wheels; (10) see that tires are properly applied; and (11) drive carefully. Avoid bumps, particularly at high speeds.

Copies of this circular may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

A new airplane thermometer, by which the minimum temperature of the air through which the plane is passing is automatically recorded, has been designed by H. B. Henrickson, of the Bureau of Standards, Department of Commerce.

The new instrument makes use of a bimetal strip and is mounted on one of the struts of the plane. It is light in weight and several can be used to determine temperatures at various points on the airplane, if desired; in fact, a number of these thermometers were used in this way by Capt. A. W. Stevens in his recent high-altitude flights at Wright Field.

TWENTY-SECOND NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

It has been said that the duty of the official inspector of weights and measures is to secure equity in all commercial determinations of quantity. The diversity of activity embraced within this definition was well illustrated at the twenty-second annual meeting of the National Conference on Weights and Measures which met at the Bureau of Standards on June 4 to 7, inclusive. Ice-cream cans, gasoline meters, grocers' scales, devices for measuring automobile transmission oil, penny-in-the-slot scales, the weighing of meats and grain, fruit and vegetable baskets, and methods for investigating reported short-measure deliveries of domestic fuel oil were some of the widely differing subjects discussed and acted upon.

The national conference is composed primarily of weights and measures officials of the States, counties, and cities of the United States, but manufacturers of weighing and measuring equipment and representatives of industry participate in the meetings. The conference was organized in 1905 under the auspices of the National Bureau of Standards for the purpose of providing an agency to coordinate and harmonize the divergent and often conflicting weights and measures requirements of the States, of extending weights and measures protection to all sections, and of raising the standard of weights and measures administration throughout the country. The facilities of the bureau for scientific and technical research are made available to the conference, and the data at hand, or secured following special studies and investigations, have repeatedly formed the basis for conference decisions and recommendations.

The actions of the National Conference on Weights and Measures are looked upon by manufacturers and officials as authoritative in its special field. While the conference is unofficial to the extent that its recommendations have no legal force and effect purely by reason of the conference action, nevertheless these recommendations become operative promptly and effectively through the action, in their several jurisdictions, of the officials composing the conference membership. One of the most important fields of conference activity is the development of codes of specifications and tolerances for commercial weighing and measuring equipment—those technical requirements which must be met by commercial apparatus before this will be approved for use by the official. Under the general police power of the States to promulgate regulations designed to carry into effect the basic principles of protection established by their weights and measures statutes it is possible to secure official acceptance of the conference decisions on codes of specifications and tolerances and other matters without delay.

As contrasted with conditions 20 years ago, the national conference has accomplished a tremendous service to the business and industrial interests of the country by bringing about the degree of uniformity in weights and measures requirements which exists to-day.

One hundred per cent conformity with the recommendations of the national conference probably never will be reached. It is to be expected that there will always be divergencies in the laws, the specifications and tolerances, and the methods of test applied as compared with the model State law, the various codes, and the testing methods adopted by the conference. This nonuniformity results in complicating manufacturing processes and raising manufacturing costs for the makers of commercial equipment, and in adding to the complexities of trade.

As a result of the meeting just ended, one class of commercial measuring device was brought definitely within the scope of the conference codes, and the inclusion of another group was forecast. Final specifications and tolerances were adopted for those devices used at automobile filling stations for measuring grease and transmission oil; a feature of this code was the requirement that these devices be made to deliver by the pint instead of by the pound unless the device actually weighs the grease dispensed. Permissible variations on deliveries were also adopted.

The question of person-weighing scales, particularly of the penny-in-the-slot variety, was discussed, and the recommendation was made that the conference committee on specifications and tolerances study these scales during the coming year with the view of bringing before the conference next year a tentative code of regulations for them.

The necessity for further study and effort directed toward promoting uniformity among the States in their weights and measures requirements was recognized in the report of a special committee appointed a year ago; the committee report was adopted by the conference, and provided for the appointment of a standing committee to devise ways and means for promoting uniformity in "all weights and measures endeavors in which uniformity is desirable." The elimination of the dry measure, sales on the basis of weight, count, or standard containers, simplification of containers and packages, and conformance with the conference recommendations as to laws, specifications, and tolerances were stressed in the report. The constructive program before this committee provides the opportunity for initiating many needed reforms, and with the cooperation of the various interests involved should produce worth-while results.

The recently adopted practice in the wholesale ice-cream industry of marketing ice cream in 2½-gallon cans instead of 5-gallon cans received the recognition of the conference. After considering the numerous advantages resulting from the use of the new container, it was decided to waive the theoretical objection to an odd-sized can providing it is of such a diameter that it will not be confused with the 2-gallon and the 3-gallon sizes.

The dangers from an accuracy standpoint of certain types of gasoline-meter installations were pointed out in a number of papers presented. It was emphasized that if the motorist is to receive full measure when he purchases gasoline the weights and measures official must give consideration not only to the measuring element of the assembly, but also to the entire installation, to make sure that conditions are such as to give reasonable assurance of continued accuracy. Direct-pressure systems, in which air pressure is main-

tained for long periods on the storage tanks, were shown to be very erratic in their performance under certain conditions. These were also represented to be a hazard from the standpoint of safety.

Covering a wide range of subjects having a direct application to the protection of buyers and sellers of commodities and service, and participated in by representatives of industrial concerns, railroads, manufacturers, and associations of business men, the Twenty-second National Conference on Weights and Measures will exert a strong influence on the administration of weights and measures throughout the United States and on the development, along proper lines, of commercial weighing and measuring devices. Not the least of its accomplishments was the demonstration of the harmonious manner in which diverse interests may meet and solve mutual problems with mutual satisfaction.

NEW PUBLICATIONS

Bureau of Standards Journal of Research, vol. 1 (RP Nos. 1 to 36), bound in cloth, \$2.75 (foreign, \$3.50).

Bureau of Standards Journal of Research, vol. 2, No. 5, May, 1929 (RP Nos. 60 to 66, inclusive). Obtainable only by subscription.¹

Research Papers (reprints from Journal of Research):

RP60. Continuous spectrum X rays from thin targets; W. W. Nicholas. Price, 10 cents.

RP61. A multiple-strand test for yarns; C. W. Schoffstall and H. A. Hamm. Price, 10 cents.

RP62. Thermal expansion of tantalum; P. Hidnert. Price, 5 cents.

RP63. Soundproofing of airplane cabins; V. L. Chrisler and W. F. Snyder. Price, 5 cents.

RP64. Prism refractometry and certain goniometrical requirements for precision; L. W. Tilton. Price, 10 cents.

RP65. A new determination of the melting point of palladium; C. O. Fairchild, W. H. Hoover, and M. F. Peters. Price, 10 cents.

RP66. A new seismometer equipped for electromagnetic damping and electromagnetic and optical magnification (theory, general design, and preliminary results); F. Wenner. Price, 15 cents.

Technologic Papers of the Bureau of Standards, vol. 22 (Nos. 353 to 370), bound in cloth, \$3.

Simplified Practice Recommendation: R95-28. Skid platforms. Price, 5 cents.

Commercial Standards: CS4-29. Staple porcelain (all clay) plumbing fixtures. Price, 10 cents.

See footnote next column.

United States Government Master Specifications:

USGMS 39c. Tubing, rubber. Price, 5 cents.

USGMS 48c. Hose, water and wash deck. Price, 5 cents.

USGMS 50b. Hose, suction, water (smooth bore). Price, 5 cents.

USGMS 63c. Hose, oil suction and discharge. Price, 5 cents.

USGMS 111b. Packings and gaskets, rubber (molded, sheet, and strip). Price, 5 cents.

USGMS 497a. Wool bunting. Price, 5 cents.

USGMS 588. Hose, water, braided. Price, 5 cents.

USGMS 518. Lamps, electric, incandescent, miniature, tungsten filament. Price, 5 cents.

1930 Supplement to USGMS 618. Price, 5 cents.

Miscellaneous Publications:

M93. Visitors' manual of the National Bureau of Standards (a brief account of its history, functions, and laboratory facilities); H. C. Boutell. Free on application to the bureau.

M94. Scientific and technical positions in the National Bureau of Standards; W. C. Fewell. Free on application to the bureau.

Technical News Bulletin: TNB146. Technical News Bulletin, June, 1929. Obtainable only by subscription.¹

¹ Send orders for publications under this heading with remittance only to the Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 25 cents per year (United States and its possessions, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama); other countries, 40 cents. Subscription to Bureau of Standards Journal of Research, \$2.75; other countries, \$3.50.

Standards and Specifications in the Wood-Using Industries

Nationally recognized Standards and Specifications for Wood
and Manufactures thereof, including Paper and Paper Products

AN ATTEMPT has been made to include in this publication the substance of all standards and specifications in the wood-using industries formulated by the lumber manufacturers' associations and other trade associations having national recognition; the national technical societies, including those dealing with lumber and manufactures thereof, paper and paper products, and other organizations which speak for industry or with the authority of the Federal Government as a whole.

ADVISORY BOARD

An Advisory Board composed of official representatives of 14 national organizations interested in the preparation, unification, and utilization of specifications recommended that the material published as the result of an exhaustive review of the standards, specifications, simplifications, and testing methods in this country, be broken into two distinct parts—one part to consist of an index of existing specifications with such explanatory matter as might be necessary to elucidate the scope of each specification, and the other part to contain copies of actual specifications (or abstracts) instead of merely titles. In 1925 the National Directory of Commodity Specifications was issued as the first part.

OUTLINE OF CONTENTS

In addition to a list of technical societies, trade associations, and other organizations issuing standards and specifications in the wood-using industries, the book contains chapters devoted to specifications relating to the following groups of commodities:

Class No.	Commodities
400-409	Timber and Other Unmanufactured or Partly Manufactured Wood.
410-419	Lumber for Building and Factory Use.
420-429	Manufactures of Wood.
430-439	Furniture of Wood.
470-479	Paper (except printed matter).
480-489	Books and Other Printed Matter.
490-499	Miscellaneous Wood and Paper Products.

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
GEORGE K. BURGESS, Director

STANDARDS AND SPECIFICATIONS IN THE WOOD-USING INDUSTRIES

NATIONALLY RECOGNIZED STANDARDS AND SPECIFICATIONS
FOR WOOD AND MANUFACTURES THEREOF, INCLUDING
PAPER AND PAPER PRODUCTS

MISCELLANEOUS PUBLICATION No. 79

The present compilation represents the beginning of the other part just referred to. It is the first of a series of publications dealing with the standards and specifications in various industries to be issued as rapidly as conditions will permit. In its use has been made of the decimal system of classification of paper and wood employed in the National Directory of Commodity Specifications. Under the proper classification numerals have been listed certain important groups of commodities for which there might well be, but are not as yet, specifications that can be referred to as nationally recognized.

Whether you are interested in the preparation or use of specifications and standards in the wood-using industries; whether you are a buyer or a seller of wood or paper or manufactures thereof, this publication contains information which you can not afford to do without.

DIRECTIONS FOR ORDERING

Copies of "Standards and Specifications in the Wood-Using Industries" (cloth bound) may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., by sending WITH the order a remittance (\$1.50) either in the form of post office money order, coupons (issued for the specific purpose of purchasing Government publications), express money order, New York draft, or cash—at the sender's own risk. It is important to follow these directions explicitly to avoid delay and confusion. An order blank is given below for your convenience. Price \$1.70 if to be mailed to a foreign country (other than Mexico and Canada).

SUPERINTENDENT OF DOCUMENTS,

U. S. Government Printing Office, Washington, D. C.

There is enclosed \$1.50 for which please send me "Standards and Specifications in the Wood-Using Industries" (Bureau of Standards Miscellaneous Publication No. 79).

Name..... Address.....

"* * * this department * * * is devoted solely to aiding and fostering the development of higher standards of living and comfort of our people * * * its ideals are clear: That by cooperation and not by compulsion it should seek to assist in maintaining and giving the impulse of progress to commerce and industry in a nation whose successful economic life underlies advancement in every other field."

—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.



THE UNITED STATES DEPARTMENT OF COMMERCE

R. P. LAMONT, Secretary of Commerce

AERONAUTICS BRANCH, WILLIAM P. McCracken, Jr., Assistant Secretary of Commerce for Aeronautics.

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Compilation of statistics of marriage, divorce, births, deaths, and penal and other institutions annually, and of death rates in cities and automobile accidents weekly.

Compilation quarterly or monthly of statistics on cotton, wool, leather, and other industries; annually of forest products; and publication monthly of Survey of Current Business.

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The study of the processes of domestic trade and commerce.

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